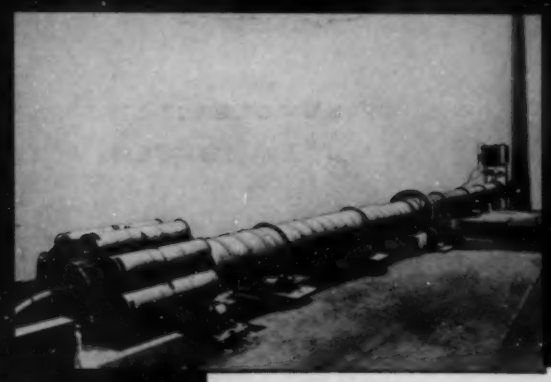
Rock Products

THE INDUSTRY'S RECOGNIZED AUTHORITY

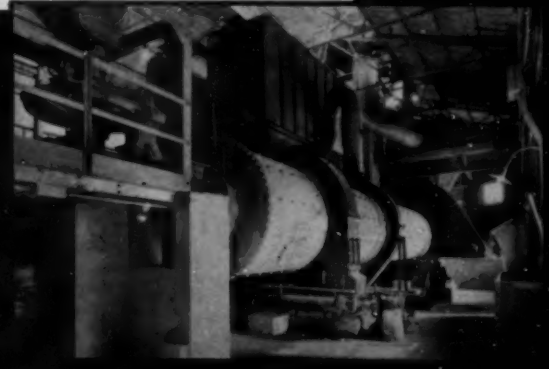
SEPTEMBER, 1941



ROTARY KILNS

Machinery for Cement-Lime-Ore

In addition to a complete line of Rotary Kilns and Grinding Mills, F. L. Smidth & Co. also manufacture Coolers, Pre-Coolers, Pre-Heaters, Recuperators, Air Separators, Agitators, Packers, Extractors, Feeders, Burners, etc. and their auxiliary equipment, for the manufacture of Cement, Lime, Ores, and Allied Products.

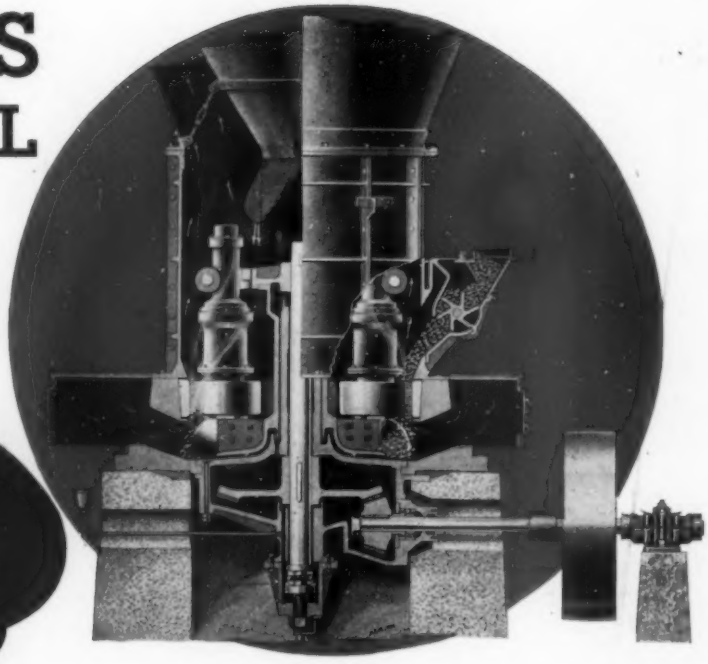


GRINDING MILLS

F. L. SMIDTH & CO.

60 EAST 42ND STREET — CEMENT ENGINEERING — CEMENT MACHINERY — NEW YORK, N. Y.

WILLIAMS ROLLER MILL WITH AIR SEPARATION



Any Fineness from **20 MESH** *to* **400 MESH**

8 DISTINCTIVE FEATURES

- **AUTOMATIC ELECTRIC FEED CONTROL** automatically adjusts the feed flow to match the capacity of the mill.
- **LONGER LIFE OF GRINDING PARTS** assured by abrasion resistant materials. Rollers and bull ring give longer life and grind materials heretofore thought too abrasive to be pulverized with roller mills.
- **ELECTRIC STEEL AND ALLOY CASTINGS** at important points. The only fine grinding mill in which electric steel and alloy castings are so liberally used.
- **SAVE POWER AND ELIMINATE DAILY LUBRICATION.** Rollers and main spindle operate on ball bearings. They not only save power but also eliminate the daily lubrication formerly required.
- **MATERIAL GROUND BETWEEN ROLLERS AND BULL RING.** The Williams Roller Mill is of the suspended roller type assuring maximum production and grinding efficiency.
- **EASY ENTRY TO MILL PROVIDED BY LARGE DOOR** permitting removal of an entire journal if necessary. Doors are carefully machined to prevent air leaks.
- **CLEAN OPERATION.** Since the Williams Roller Mill System operates under a slight vacuum its operation is extremely clean and dustless.
- **LOW POWER CONSUMPTION.** In terms of horse power consumed per ton ground the Williams Mill is the most economical grinding machine known. In actual performance it has been proved to use less power per ton than any similar known device.

WILLIAMS IMPACT MILL WITH AIR SEPARATOR

Many jobs are made to order for the Williams Impact Mill. Used for grinding hydrated lime to 99.99%—325 mesh, clays filter press cake—Dries and grinds simultaneously.

WILLIAMS SUPER-SEPARATOR

The most efficient separator known when operating on ordinary non-sticky materials. Most flexible for commercial work. Fineness is regulated by the setting of the vanes—one adjustment sets all vanes. Fineness can be varied from 70%—200 mesh to 99.97%—325 mesh.

WILLIAMS "SPINNER" AIR SEPARATOR

Especially well suited to handling of sticky materials. On such materials gives greater output and there is no tendency to clog. Fineness of product is controlled by increasing or decreasing speed of "Spinner" blades.

THE WILLIAMS PATENT CRUSHER & PULVERIZER COMPANY

800 St. Louis Ave. St. Louis, Mo.

Sales Agencies Include

Chicago, 37 W. VanBuren St. — New York, 15 Park Row — Oakland, Calif., 1629 Telegraph Ave.

Williams — OLDEST AND LARGEST BUILDERS OF HAMMERMILLS IN THE WORLD — PATENT CRUSHERS GRINDERS SHREDDERS

YOU SHOULD HAVE THESE WILLIAMS BULLETINS

No. 580 describing the Williams line of Fine Grinding and Air Separating Equipment.

No. 569 describing the Williams "Slugger" type Crushers and Pulverizers for making 1¼", ¾" or agricultural limestone. Write today.

...Just another job

"IS MACHINERY a good thing?" Honest people were asking that, yesterday. No one is asking it, today.

Today, every factory is a sanctuary—its whirring wheels, an anthem of hope — its cement, sacred — the men who run it, saviors.

For the battle is no longer between men—it has graduated into a gigantic struggle, to the death, between machinery and minutes! A struggle for which we are seasoned! A problem we, as a people, have been brought up on! An assignment we know we can lick. A tough task, yes—but one that is being done. American Mass Production looks on this as—JUST ANOTHER JOB!

Its smile of confidence spreads to the face of the Nation. Its steel is in our hearts.

LINK-BELT joins American industry, which it has so long served, in the firm resolve that "Government of the People, by the People, and for the People shall not perish from the earth."

★ ★ ★

Link-Belt is proud of its part in the national defense effort —approximately 80 per cent of our output today is direct or indirect defense material.

Essential defense work being fabricated in the Link-Belt plants includes orders for the Army, the Navy, the Anti-Aircraft Division, the Air Force, the munitions-producing plants—and, not the least important, the supplying of equipment to all American Industry whose products are essential to defense.

LINK-BELT COMPANY

Chicago Philadelphia Indianapolis Atlanta Cedar Rapids Dallas San Francisco Toronto

MATERIALS HANDLING MACHINERY — **MECHANICAL TRANSMISSION EQUIPMENT**

SEP 13 1941 ©CIB 512003

Rock Products

Recognized the World Over as the Leader in Its Field

With which has been consolidated the journals *Cement and Engineering News* (founded 1896) and *Concrete Products* (established 1918)

VOL. 44, No. 9, SEPTEMBER, 1941

Contents of This Issue

Who Is Going to Sacrifice What?
Nathan C. Rockwood 23

Surplus Gravel Reduced to Sand
Impact crusher produces desirable gradations of sand with the aid of vibrating screens and classifiers 29

Sampling in Cement Manufacture
Practice at the Fort Whyte Plant, Manitoba, Canada Cement Co., Ltd.
C. J. Murphy 32

Nodulizing Phosphate in Kilns
Efficient phosphate recovery from lower grade matrix made possible by increased flotation capacity
Bror Nordberg 37

No Silica Wasted
Central Silica Co. has developed new market outlets for numerous silica products 41

Mica—A War Boom Industry
Sheet mica is on the list of strategic minerals, but biggest production is in ground mica 48

Process Feldspar for Glass
Requires tight setting of crusher and accurate regulation of the circulating load 52

Making a Finer Rock Wool
Waukesha Lime and Stone Co. installs new cupola and improves method of rock wool manufacture 53

Big Business in a Small City
Sell concrete block, joists, floor tile, brick and pipe over a 75-mile radius 61

Making Joists of Pre-Rolled Structural Concrete
Formigli Architectural Stone Co. has unique production line method of manufacturing joists
Bror Nordberg 62

Cinder Products Convention
Industry reports plants operating three shifts per day 70

Departments

Staff Letter	19	Special Products Section	35
Editorial	23	New Machinery	73
News and Comment	24	Concrete Products	59
Hints and Helps	26	Traffic News	88
News About People	28	Index of Advertisers	96

ROCK PRODUCTS
Owned and Published by
TRADEPRESS PUBLISHING CORPORATION
PUBLICATION OFFICES
309 West Jackson Blvd., Chicago, Ill.
Telephone—Harrison 7890

Nathan C. Rockwood
Editor

Ralph S. Torgerson *Managing Editor*
Bror Nordberg *Associate Editor*

Frank Richter
Assistant Editor

★

CONTRIBUTING EDITORS
Victor J. Azbe St. Louis, Mo.
Dr. F. O. Anderegg Newark, Ohio

★

FIELD REPRESENTATIVES
A. B. Maynard **C. P. Teats**

★

BUSINESS STAFF
Richard M. Ward, Manager
L. V. Rodda, Circulation Manager
John R. Thompson, Vice-President and Treasurer

ADVERTISING REPRESENTATIVES
Wm. A. Buschman, Eastern Representative
522 Fifth Avenue, New York City
Tel. Murray Hill 2-7888
George M. Earnshaw
405 Erie Building
2123 East 9th Street, Cleveland, Ohio
Tel. Main 9645
Louis C. Thaon
Western Representative
Chicago Office, Tel. Harrison 7890

WEST COAST REPRESENTATIVES
Duncan A. Scott & Co.
Mills Building, San Francisco, Calif.
Tel. Sutter 1393
Philip Bissell
445 Western Pacific Building
Los Angeles, Calif.
Tel. Prospect 5319

LONDON OFFICE
Donald F. Hunter, Manager
Quadrant House, 55, 58, Pall Mall,
London, S. W. 1

Subscription Price: United States and Possessions, Mexico, Cuba, Canada, $2.00; and $4.00 to foreign countries. Twenty-five cents for single copies. Indexed in the Industrial Arts Index.

To Subscribers — Date on envelope indicates issue with which your subscription expires. In writing to have address changed, give old as well as new address.

ROCK PRODUCTS Bears the Twin Hall-Marks of Known Value.

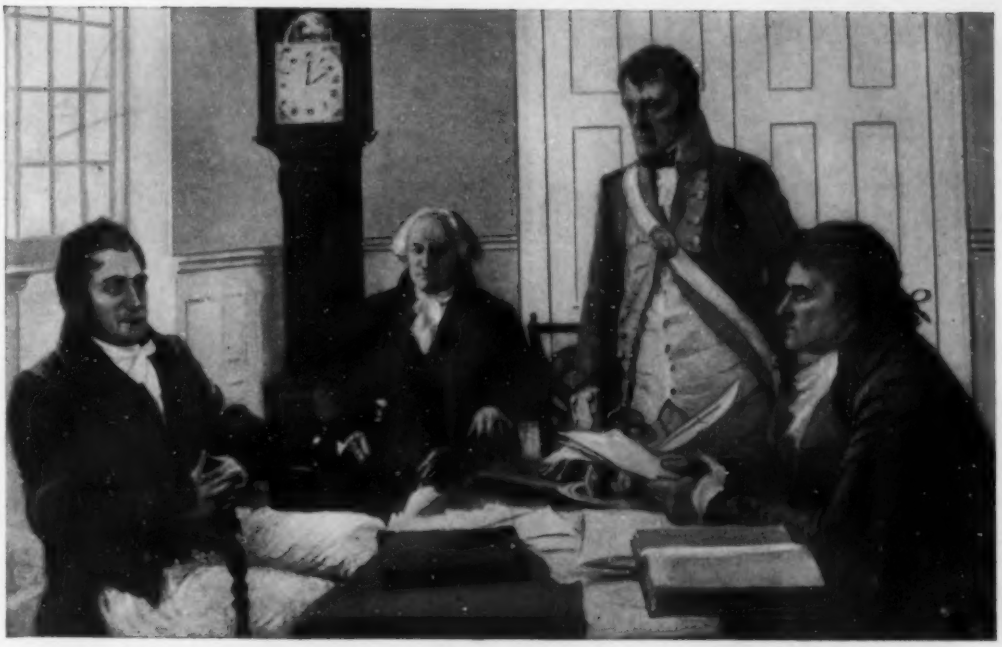
Impartial measurement of reader interest in terms of paid circulation.

★

Authentic facts relating to editorial scope and readership analysis.

(PUBLISHED MONTHLY AT CHICAGO, ILL., U. S. A.)

Entered as second-class matter, Jan. 30, 1936, at the Chicago, Ill., postoffice under the Act of March 3, 1879. Copyrighted, 1941, by Tradepress Publishing Corporation.



E. I. du Pont de Nemours discussing the location of the first Du Pont powder mill with Thomas Jefferson, President of the United States, his friend and customer. From a painting by S. M. Arthurs.

Du Pont Explosives...*in the long rifles of the pioneers of yesterday*... in the industries that are America's defense today!

TODAY is very much like the world of 1800. That was the year the Du Pont family came to America, fleeing a Europe racked by war and revolution. The Reign of Terror had ruined their business. Their closest friend, the great chemist Lavoisier, had been beheaded.

In America, E. I. du Pont discovered that our powder mills were small, poorly run and out-of-date—that we were dependent on England for the best gunpowder. Relying on his training under Lavoisier and encouraged by the family friendship with Thomas Jefferson, he resolved to establish powder mills here equal to those of Europe. The outcome was the founding in 1802 of E. I. du Pont de Nemours & Company.

In the 139 years that have followed, Du Pont's resources and technical skill have been at the nation's command in peace and in war. In these many years, Du Pont explosives and blasting accessories have contributed mightily to the building of America—have made possible mining, quarrying, construction, land clearance and oil prospecting on an ever expanding scale.

Today, America's industries are a vital part of our National Defense and Du Pont explosives are helping to deliver the raw materials they so urgently need—quickly, efficiently and at minimum cost.

139 YEARS OF DU PONT EXPLOSIVES LEADERSHIP

"Gulf helps do a speedier, more profitable job"

*. . . says contractor on airport project **

"With Gulf quality lubricants and fuels in service, we get efficient performance from our equipment and avoid unnecessary delays. Result: We're well ahead of contract schedule — and have an excellent cost record."

*Mauger Construction Company of Columbus, Ohio, and Charleston, West Virginia, and the Samons Construction Company (associated with the foregoing) of Huntington, West Virginia, are ahead of schedule on this huge airport project at Cumberland, Maryland. Gulf lubricants and fuels are helping them attain an efficient operating record.

"WITH Gulf quality lubricants and fuels in service, we're getting efficient, trouble-free performance from our equipment on this airport project," says this contractor. "In addition, our operating and maintenance costs are low — so, thanks to Gulf, we're doing a speedier, more profitable job."

Are you entirely satisfied with the recent operating record of *your* equipment? If not, make sure that on your next job you get the benefits of Gulf quality lubricants and fuels. They are quickly available to you through more than 1200 warehouses in 30 states from Maine to New Mexico. Write or 'phone your nearest Gulf office today.

GULF

GULF OIL CORPORATION
GULF REFINING COMPANY
Gulf Building · Pittsburgh, Pa.

Freedom from
COMPLEX SWITCHING APPARATUS

In this remarkable "Double" Ward Leonard Electric Control, P&H has reduced control currents by approximately 96%. Thus, there is more positive making and breaking of proper circuits to prevent failure of secondary control apparatus — heretofore one of the major causes of service interruptions. This "Double" Electric Control is found only on P&H Ward Leonard Excavators. Get all the facts about it. Write us.

General Offices: 4465 West National Avenue, Milwaukee, Wisconsin

HARNISCHFEGER CORPORATION

EXCAVATORS · ELECTRIC CRANES · ARC WELDERS · P&H · HOISTS · WELDING ELECTRODES · MOTORS

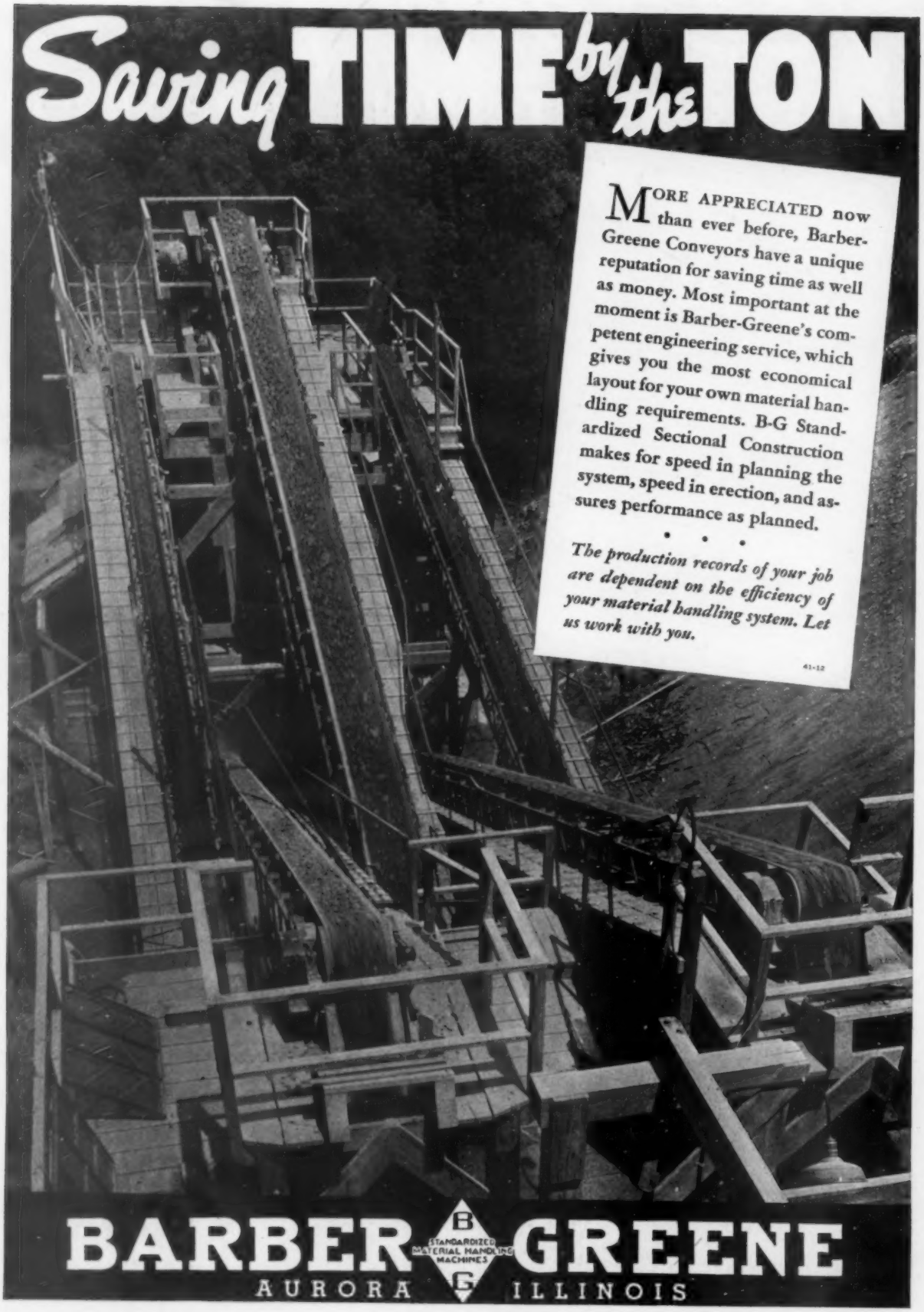
P&H

WARD LEONARD ELECTRICS

The toughest excavator construction known — rolled alloy steels, welded throughout.

Built in sizes from 2½ to 5 cu. yds. capacity. Presently, we are able to offer very prompt delivery on several machines.

Saving TIME by the TON



MORE APPRECIATED now than ever before, Barber-Greene Conveyors have a unique reputation for saving time as well as money. Most important at the moment is Barber-Greene's competent engineering service, which gives you the most economical layout for your own material handling requirements. B-G Standardized Sectional Construction makes for speed in planning the system, speed in erection, and assures performance as planned.

• • •

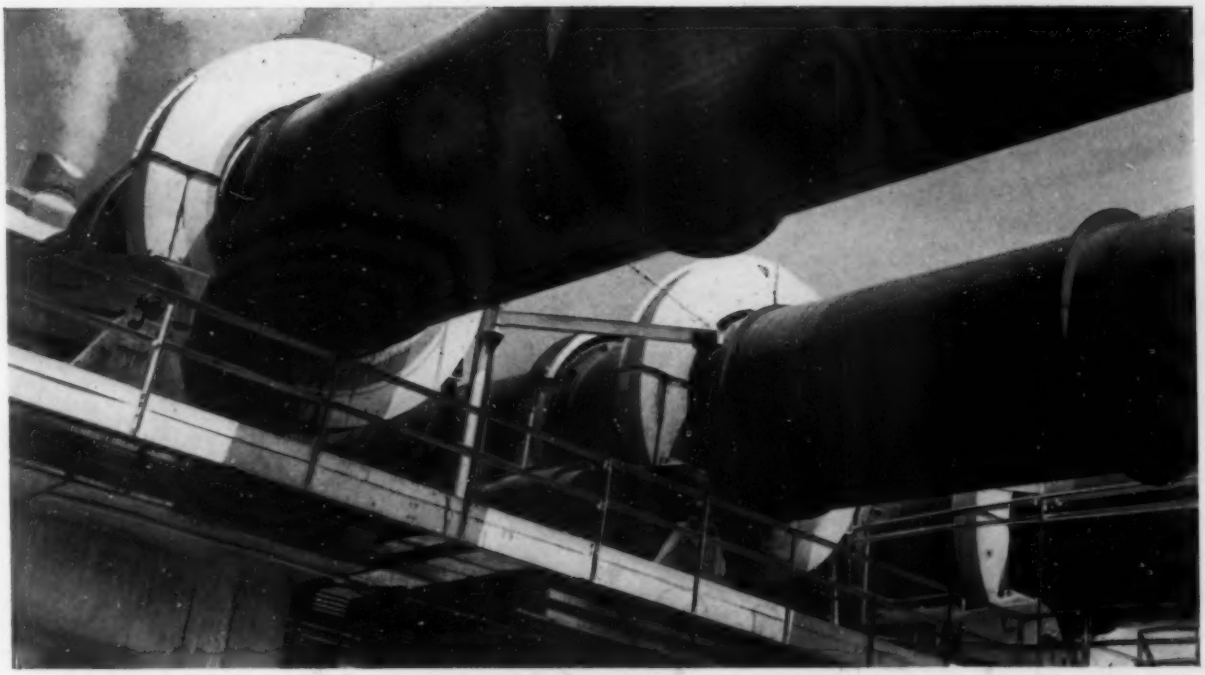
The production records of your job are dependent on the efficiency of your material handling system. Let us work with you.

41-12

BARBER GREENE

STANDARDIZED MATERIAL HANDLING MACHINES

AURORA ILLINOIS



TRAYLOR

KILNS • COOLERS • DRYERS

WE BUILD

Rotary Kilns
Rotary Coolers
Rotary Dryers
Rotary Sinkers
Scrubbers
Evaporators
Jaw Crushers
Gyratory Crushers
Reduction Crushers
Crushing Rolls
Grinding Mills
Ball Mills
Rod Mills
Tube Mills
Pug Mills
Wash Mills
Feeders
Rotary Screens
Elevators

AT ALL TIMES, and particularly now, the main requirements of a unit of mechanical equipment are that it shall render DESIRED SERVICE and PRODUCE PROFITS.

Traylor Rotary Kilns, Coolers and Dryers fulfill these expectations of exacting engineers completely, masterfully. Which is why they are highly regarded and preferred, in the cement industry, in the lime manufacturing and chemical fields and in other process industries.

The reason is fundamental—our engineers have intimate contact with and wide experience in these industries, enabling them always to be a step ahead in the designs they offer.

Our facilities for expert advice and assistance are ever at your command. Use them freely, without obligation. Write us today!

SEE OUR BULLETIN No. 115

TRAYLOR

ENGINEERING & MANUFACTURING CO.

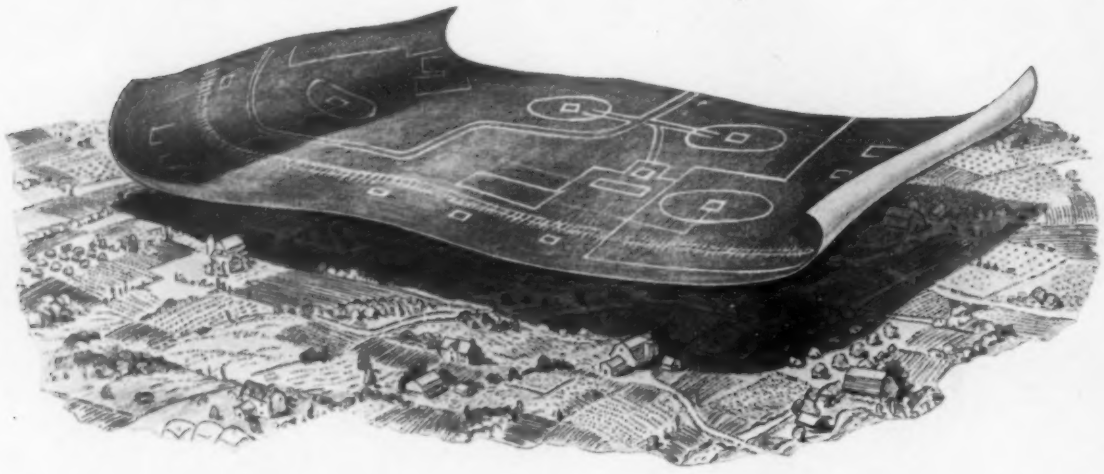
MAIN OFFICE AND WORKS — ALLENTOWN, PENNA., U.S.A.

NEW YORK CITY, 3916 Empire State Bldg. — CHICAGO, 2051 One La Salle St. Bldg. — SALT LAKE CITY, 101 West Second South St. — LOS ANGELES, 919 Chester Williams Bldg. — SEATTLE, 6311-22d. Ave. N. E.

B. C. EQUIPMENT CO., LTD., 551 Howe St., Vancouver, B. C. — MANILA MACH. & SUPPLY CO., INC., Manila and Baguio, P. I. — MAQUINARIA INTERNACIONAL, S. R. L., Av. Francisco I. Madero No. 17, Desp. 214, Mexico, D. F.

Export Department—104 Pearl St., New York City. Foreign Sales Agencies: London, Lima, Sao Paulo, Rio de Janeiro, Buenos Aires, Santiago, Valparaiso, Antofagasta, Oruro, San Juan, P. R.

Where Stood 200 Farms–



A Gigantic Ordnance Project is Now in Operation

As you read this, thousands of men and women are loading shells and bombs for America's defense —in a 40-square-mile area where, a year ago, two hundred farmers were peacefully tilling their fields.

This area is the Ravenna Ordnance Plant. It was built by general contractors. It is owned by the Government. Atlas Powder Company has been designated to operate the plant for the Government.

For months, Atlas has been training and organizing personnel to do a competent job—and to provide for the health, safety and comfort vital to efficient operation. But Ravenna, though the largest, is but one of Atlas' Defense operations.

Great Government-owned plants for making TNT and DNT are nearing completion at Weldon Spring. They will be operated by Atlas for the Government. At another point, an Atlas plant has been producing TNT for over two years. Still another works has been fulfilling TNT contracts for Britain for over a year. Two Atlas-owned loading plants are operating and, finally, another Atlas plant is devoted to making Black Powder Spotting Charges.

Atlas, of course, is essentially a manufacturer of peacetime products. Because munitions require entirely different equipment and materials, commercial explosives plants are neither suitable nor convertible to military use. However, Atlas has retained the art, science and engineering skill so important in munitions operations and has turned them to account in these new Defense projects.

At the same time, Atlas' regular products enter directly or indirectly into Defense activity in other industries. Explosives are "musts" for construction, mining, quarrying. Chemicals, carbons, finishes are required for countless industrial uses.

Atlas' duty, then, is to carry both loads. To do this demands tremendous effort on our part, with hundreds of veteran employes assigned to new duties, and with thousands of new men and women employed. We know that our customers likewise are doing their part. They recognize, as we do, the necessity that all hands pull together to solve Industry's problems and provide the Nation with the Defense materiel it needs today.

ATLAS EXPLOSIVES
"Everything for Blasting"

CHEMICALS ATLAS EXPLOSIVES

ATLAS POWDER COMPANY, Wilmington, Del. · Offices in principal cities · Cable Address—Atpowco

It Is Still The Most Economical Crusher For Making Minus Half Inch Sizes

Discharge belt below the crusher carrying away the minus ⅜" product.

The minus 3" feed coming to crusher at the rate of 250 tons per hour.

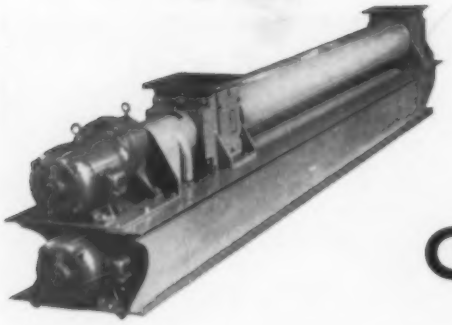
Where there are demands for large tonnages of minus ½ inch sizes, the Symons Short Head Cone is without equal for producing such materials. The performance of this 7 foot machine in making 250 tons per hour of minus ⅜ inch from a minus 3 inch feed is typical of what these crushers are doing on many fine reduction crushing jobs. With a rapidly increased use of finely crushed materials, this modern crusher will make the required sizes at a cost which assures of greater operating profit.

If you are interested in securing greater capacity of fine product at lower cost, investigate the advantages of Symons Short Head Cone Crushers.

NORDBERG MFG. CO., MILWAUKEE WISCONSIN

NEW YORK	LOS ANGELES	LONDON	TORONTO
60 East 42nd Street	Subway Term. Bldg.	Bush House	Concourse Bldg.

SYMONS CONE CRUSHERS



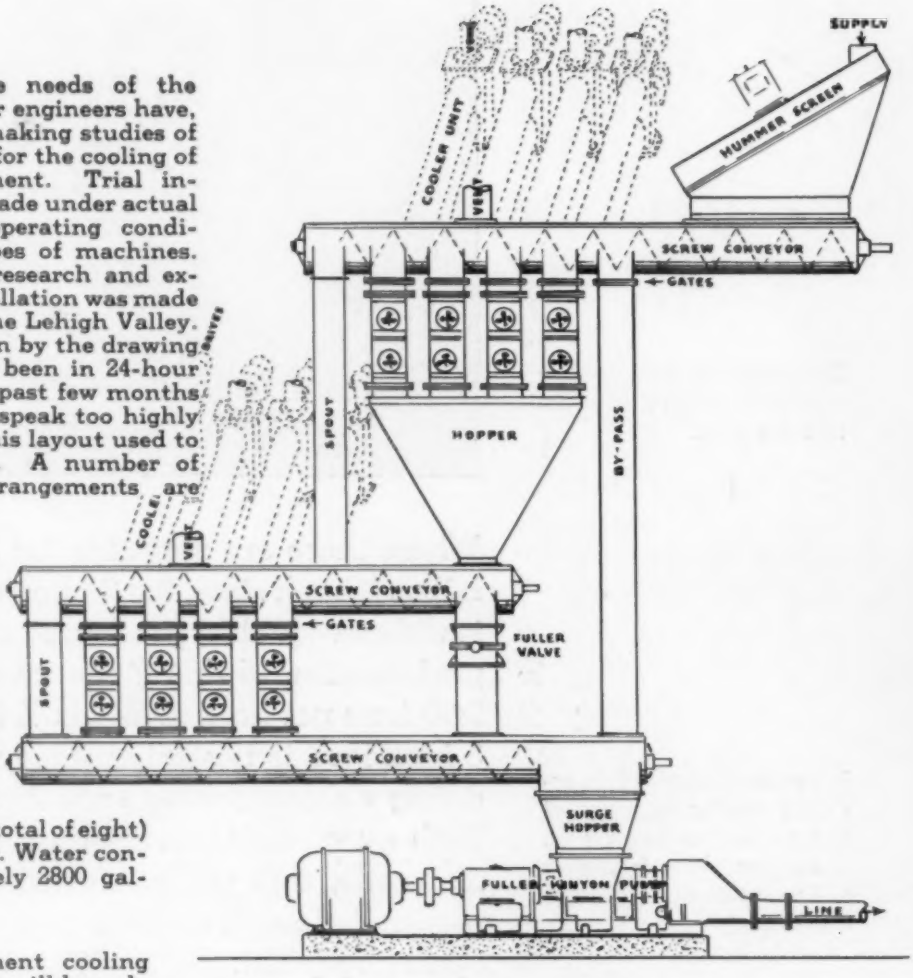
Fuller Cement Cooler Unit, 50 barrels capacity.

THE FULLER CEMENT COOLER

Always alert to the needs of the cement industry, Fuller engineers have, for a long time, been making studies of equipment and means for the cooling of finished Portland cement. Trial installations have been made under actual manufacturing and operating conditions with varying types of machines. After this exhaustive research and experimentation, an installation was made in a cement plant in the Lehigh Valley. This installation, shown by the drawing on the right, has now been in 24-hour per day service for the past few months and its owners cannot speak too highly of its performance. This layout used to meet local conditions. A number of other installation arrangements are possible.

Cement is handled at the rate of approximately 400 barrels an hour, the material entering the cooler at an average temperature of slightly over 260°F., and is delivered to the conveying system at an average of 140°F. Power required for driving these coolers (a total of eight) is about 40 horsepower. Water consumption approximately 2800 gallons per 100 barrels.

If you have a cement cooling problem, our engineers will be only too glad to work with you. No obligation on your part.



FULLER COMPANY

CATASAUQUA, PENNSYLVANIA

Chicago: 1118 Marquette Bldg.
San Francisco: 320-321 Chancery Bldg.

CC-1

FULLER-KINYON, FLUXO, AND AIRVEYOR CONVEYING SYSTEMS · · · ROTARY FEEDERS AND DISCHARGE GATES
ROTARY AIR COMPRESSORS AND VACUUM PUMPS · · · · AIR-QUENCHING COOLERS · · · · BIN SIGNALS

ROEBLING

"Bridges a Century with Wire"

100 years ago John A. Roebling founded the company which still bears his name.

» » Today, after a century of service, the name Roebling is still synonymous with leadership in wire manufacture, improvement and application.

» » In celebrating its 100th Anniversary, Roebling looks forward to the opportunity of serving industry in even greater measure than ever before.

JOHN A. ROEBLING'S SONS COMPANY

TRENTON, NEW JERSEY

NEW NAVAL AIR BASE

Needs 370,000 yards sand and gravel

The 18" x 30" *Telsmith Roller Bearing Jaw Crusher* (center background) crushes the plus 4" material rejected by the *Telsmith Rotary Grizzly;* and a No. 36 *Telsmith Gyrasphere Crusher* (left foreground) crushes 2½" to 4" rejected by *Single Deck Telsmith Pulsator* vibrating screen.

THIS TELSMITH PLANT RUNS 20 HOURS A DAY TO SUPPLY IT

The Navy's new 25 million dollar air base at Quonset Point, R. I., will require about 370,000 yards of washed sand and gravel. This aggregate is being furnished by the Boston Sand & Gravel Co. of Cambridge, Mass., with a brand new and completely modern Telsmith Plant located near East Greenwich, R. I.

Telsmith engineers, in co-operation with the Boston Company officials, designed the plant especially for this job, and all major equipment was furnished by Telsmith. A capacity of 150 T.P.H. was figured, but the plant produces as high as 250 T.P.H. Average production is 200 T.P.H. of Navy 1" and 2" aggregate and concrete sand—4000 tons per 20-hour day, with plant operating at times at temperature as low as 16° F.

For dependable advice and quick service coupled with the best in equipment, bring your problem to Telsmith. *Write for descriptive Bulletin G-11.*

SMITH ENGINEERING WORKS
509 E. CAPITOL DRIVE, MILWAUKEE, WIS.

Cable Addresses: Smgworks, Milwaukee—Concrete, London

Room 1604—50 East 42nd St.
New York City

211 W. Wacker Drive
Chicago, Ill.

513 Commercial Trust Bldg.
Philadelphia, Pa.

19-21 Charles St.
Cambridge, Mass.

Brandeis M. & S. Co.
Louisville, Ky.

Charleston Trac. & Eqpt. Corp.
Charleston, W. Va.

Roanoke Trac. & Eqpt. Co.
Roanoke, Va.

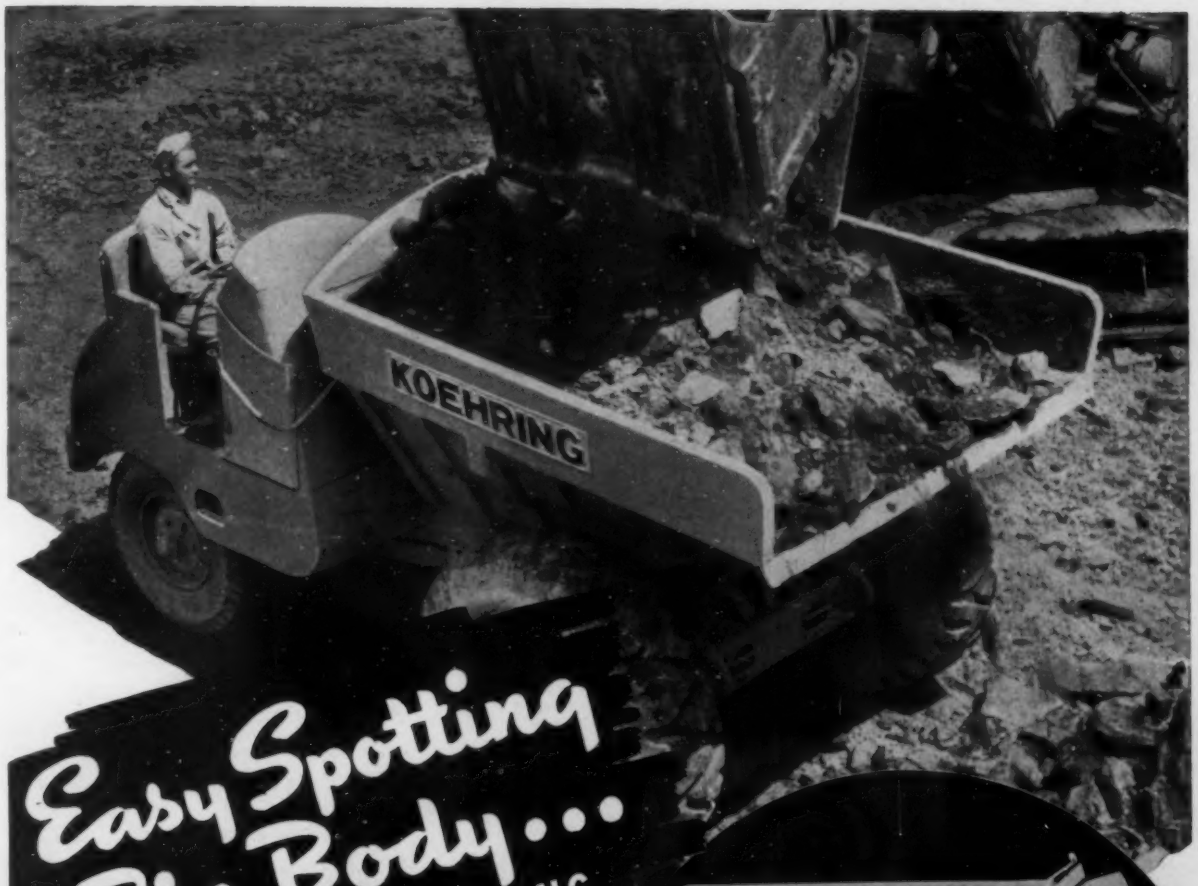
G. F. Seeley & Co.
Toronto, Ont.

Under hopper with rail-bar grizzly, 30" x 5'6" *Telsmith Plate Feeder* regulates flow of material onto belt conveyor feeding scalping and crushing plant.

Throughs from a No. 450 *Telsmith Rotary Grizzly* flow over a 5' x 10' *Telsmith Single Deck Pulsator* and minus 2½" goes to washing and screening plant.

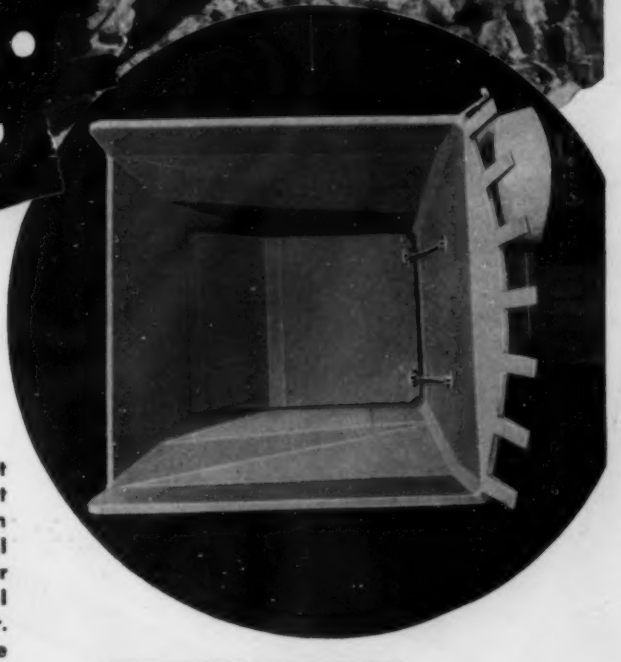
Both crushers discharge onto a return conveyor and, at point of transfer to main conveyor, a 3' x 8' *Telsmith Double Deck Pulsator* removes fines.

60" x 18' *Telsmith Standard Washing Screen* scrubs and sizes gravel. 48" x 24' and 36" x 20' *Telsmith Sand Drags* wash and dewater sand.



Easy Spotting Big Body...

FOR HIGH SPEED LOADING



FAST...EASY-LOADING... MORE YARDS PER HOUR

More loads per hour means more yardage per shift . . . and production is what counts today! And that is why the KOEHRING DUMPTOR can help you on those tough schedule jobs. Short wheelbase and full forward operator vision makes it easy to maneuver in tight spots, close to the shovel. That cuts shovel swing time for more passes of the dipper per hour. Wide body top opening makes it easy to spot the dipper load. That saves more time. And then the full speed reverse gets the Dumptor away from the shovel without delay . . . speeding on its way to the fill. *Seconds are saved with every move . . . you get more loads per hour with the KOEHRING DUMPTORS!*

KOEHRING COMPANY • *Milwaukee, Wis.*

Wide body top opening permits instantaneous dumping from the shovel dipper, for more loads per hour . . . more yardage per shift . . . lower hauling costs with the KOEHRING DUMPTOR.

KOEHRING HEAVY DUTY

HEAVY-DUTY CONSTRUCTION EQUIPMENT

South American

YOU'LL GET---
A BIRD'S EYE VIEW OF---

Enchanting South America's swelling industrial tide

New frontiers are being pioneered. Latent resources are transforming unsettled territory into bee hives of activity.

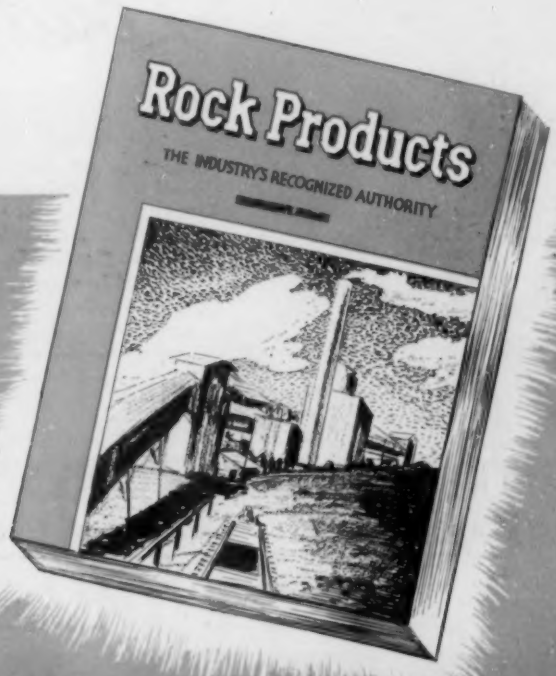
New plants are being opened. Old ones modernized. New problems are developing. New problems are being solved.

Again ROCK PRODUCTS scores in its editorial pioneering as "the industry's recognized authority" must pioneer.*

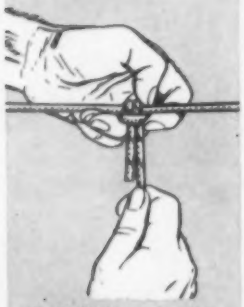
* *Other* EDITORIAL FIRSTS

1. FIRST, by many years, to have an editorial page.
2. FIRST to employ **only** experienced technical engineers as editors. The only journal today with this policy.
3. FIRST to help found national associations: National Crushed Stone; National Sand and Gravel; National Lime; **all** had a ROCK PRODUCTS editor for their **first** secretary.
4. FIRST journal to gain international recognition and still leader as such.
5. FIRST to present financial reports of companies in its field.
6. FIRST and only journal to finance editorial trips abroad for its editorial staff.
7. FIRST to expound principles of sand settling and separation.
8. FIRST and only journal with regular monthly departments for lime and cement chemists.
9. FIRST and only journal to provide the plant superintendent with a regular monthly department of practical plant operation; "Hints and Helps for Superintendents."
10. FIRST to introduce a freight-rate-changes department.
11. FIRST to become a member of the A.B.C.—the recognized organization of paid circulation journalism.
12. FIRST and only to become member of the A.B.P.—the recognized organization of leading business journalism.
13. FIRST paid circulation journal in its industry.
14. FIRST to provide the industry with a standard size business journal.
15. FIRST and only journal in this industry to be listed in the Industrial Arts index.
16. FIRST and only journal in this industry to contribute editorially to Encyclopedia Britanica.

Number

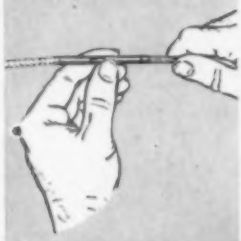


1. Tie through cartridge.



2. Half hitch branch to main line.

3. Connect main line lengths with square knot.



4. Fuse and cap on end of main line.

IMPORTANT

Branch lines should lead away from main lines at *right angles*. Avoid kinks and small loops.

Loading is Simplified

When you detonate with Primacord-Bickford Detonating Fuse, you are saved the labor of preparing separate primer cartridges with fuse and caps or electric blasting caps. For the Primacord detonates every cartridge in each hole, even when separated as in deck loads. Furthermore, you are working with a tough, flexible material, light in weight and strong . . . a detonating fuse that is insensitive to friction, fire, or ordinary shock.

These are some of the reasons why more and more Primacord is being used, even for the relatively small blast.

PRIMACORD BICKFORD
Detonating Fuse

PB-36

THE ENSIGN-BICKFORD COMPANY • SIMSBURY, CONN.

Makers of Cordeau-Bickford Detonating Fuse—and Safety Fuse since 1836

LUDLOW-SAYLOR

CONTROLLED-TEMPER SUPER-LOY WOVEN WIRE SCREENS

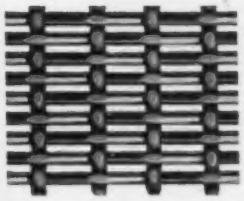
for super-severe service

●

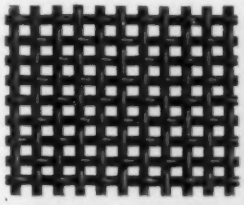
SUPER-HARD, SUPER-TOUGH, SUPER-STRONG

CONTROLLED-TEMPER SUPER-LOY WOVEN WIRE SCREENS

withstand abrasion longer —
endure vibration better —
resist fatigue to the utmost



REK-TANG long-slot weave



DOUBLE-CRIMP square-mesh weave

The background at top of page shows the "Perfect" Double-Crimp Weave.

The small cuts in the center panel compare REK-TANG Weave and Double-Crimp Weave.

The border at foot of page shows "Perfect" Double-Crimp Steel Wire Cloth which has been hot-dip galvanized after weaving.

Samples on request.

The LUDLOW-SAYLOR WIRE COMPANY
SAINT LOUIS

Ingersoll-Rand Type "S"

A 600 hp. Type S Diesel for a stationary power plant installation.

The Outstanding Diesel Engine of its horsepower range

3, 4, 5, 6, 7 and 8 Cylinder Sizes
225, 300, 375, 450, 525 and 600 hp

Ingersoll-Rand's Type S Diesel is a medium speed, heavy-duty engine which combines features essential to long life in a design that is compact and light enough to be shipped fully-assembled.

This four-cycle engine has established outstanding records for economy and endurance in continuous service. This is to be expected from a design which includes such features as: twin-nozzle solid fuel injection; full force-feed lubrication with oil cooling and filtering; wet-type cylinder liners; overhead valves; shell bearings; and controlled high-velocity cooling.

Type S Diesels operate at 720 rpm, and are suitable for both marine and stationary service.

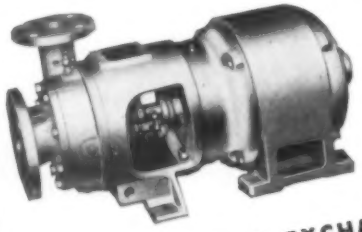
A new catalog, Form 10310, will be sent upon request.

DIESEL ENGINE AUXILIARIES

STARTING-AIR COMPRESSORS

Ingersoll-Rand starting-air compressors are built in sizes from 6.5 to 334 cfm displacement, for 250 lb and higher air pressures. The larger two-stage water-cooled unit shown at the right is a Type 40-W complete with built-in intercooler, aftercooler, and moisture separator.

COOLING WATER PUMPS

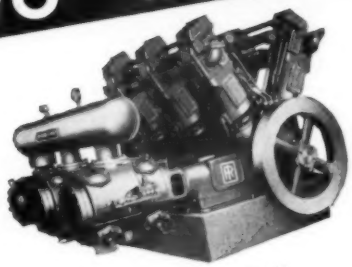


I-R Motorpumps are close-coupled, dependable units which are ideal for circulating water through heat exchangers, cooling towers, etc. Other I-R pumps include many sizes of coupled pumps for motor or turbine drive.

HEAT EXCHANGERS

Shell- and tube-type heat exchangers can be supplied. Corrosion-resistant tube nests in I-R shell-type heat exchangers are easy to clean. Correct fluid flow design provides maximum heat transfer for specified water volumes.

XVO DIESEL-ENGINE-DRIVEN COMPRESSORS



NEW COMPRESSOR ECONOMIES FOR DIESEL-POWERED PLANTS are created by Ingersoll-Rand's XVO Compressor. This unit employs the same fuel and combustion system as the Type S Engine. It will compress 933 cu ft of free air to 100-lb pressure with ⅛ gallon of 6¢ fuel oil—that's 933 cu ft for 1¢!

The XVO combines a heavy-duty 4-cycle Diesel-Engine and a horizontal heavy-duty double-acting compressor in a single compact and comparatively light-weight unit.

Built with 2, 4, 6 or 8 power cylinders; rated at 335, 700, 1075 and 1450 cfm free air at 100-lb pressure.

Atlanta · Birmingham · Boston · Buffalo · Butte · Chicago · Cincinnati · Cleveland · Dallas · Denver · Detroit · Duluth · El Paso · Hartford · Houston · Kansas City · Knoxville · Los Angeles · Newark · New Orleans · New York · Philadelphia · Picher · Pittsburgh · Pottsville · Salt Lake City · San Francisco · Scranton · Seattle · St. Louis · St. Paul · Tulsa · Washington

Ingersoll-Rand

11 BROADWAY, NEW YORK CITY

Branches or Distributors in other Principal cities the world over.

Montreal • Mexico • Havana • Rio de Janeiro • Caracas • Buenos Aires • Lima • London • Paris • Madrid • Lisbon • Melbourne • Calcutta • Johannesburg

Rock Products

309 WEST JACKSON BOULEVARD
CHICAGO, ILL.

September 1, 1941

Dear Subscriber:

Chicago, Ill.: Steel company officials favor a nation-wide scrap collection campaign to increase the supply of scrap metals. Since we editors have seldom seen a rock products plant without a considerable collection of scrap iron and steel, we suggest operators give this matter serious attention. As said on this page before, be sure to separate out your manganese-steel and other alloy parts, because these are most in demand and will help the cause more than anything else. It's a good time to clean up, help the cause and cash in.

Washington, D.C.: In spite of the demand for materials for strictly war purposes, construction in July reached about the highest level ever - almost a billion dollars. This year, 1941, it is expected to see a ten billion dollar construction program. Evidently demand for machinery for the construction materials industries will far exceed possibilities of deliveries in the near future, and producers will have to practice patience and learn to operate most efficiently with what they have. There should be little difficulty in getting repair parts, if the plants are furnishing materials for defense projects - if the O.P.M. means what it says.

Washington, D.C.: It is proposed to fix ceiling prices on building materials this Fall. The producers are now supposed to be filling out questionnaires as to costs. Incidentally the Civil Service is looking for men who know the various industries and are capable of analyzing costs and of negotiating with industry groups. Building material costs have not risen anything like food and clothing prices, but they affect the government more directly - and producers and manufacturers unfortunately haven't the voting strength of the farmers.

Quincy, Mass.: The Granite Railway Co. here is accused by the Federal Trade Commission of misrepresenting the blocks of granite it markets by describing it as "lasting until everlasting", "everlasting" and "most enduring". The company answers that it has never represented that its granite "would not stain, tarnish, fade or show in some manner the ravages of time", but that these are no indication or evidence of deterioration, disintegration or decomposition. The answer also states: "that when used to characterize things of this world as distinguished from the life hereafter, such words and phrases as 'lasting until everlasting' and 'everlasting' and similar phrases are used in the relative sense, rather than their literal sense, and mean continuing indefinitely or during a long period and denies that any substantial portion of the buying public is misled or deceived by such claims." Incidentally, if we remember our reading of railway history correctly, the Granite Railway Co. built the first railway in America, way back about 1804, long before locomotives were thought of. The company was quarrying granite long before that, so it ought to be a good judge of its product. You rock products producers who have been using the slogan "Concrete for Permanence" better watch out or the F.T.C. will get you bye and bye!

Washington, D.C.: A federal circuit court of appeals has decided that the famous Bill of Rights in our Constitution of the United States, which says that the Congress shall make no laws abridging freedom of speech, really doesn't mean that at all. The court held that the "privilege of free speech" is not absolute, and that the National Labor Relations Board has the power to determine when an employer is properly exercising this privilege in a discussion of labor unions. And subsequently the N.L.R.B. ruled that a company executive who offered to bet that a union would lose a coming N.L.R.B. election at his plant violated the Wagner Act. God help America; the blessing may not otherwise be called for!

Fresno, Calif.: About $100,000 has been recovered in gold dust from the sand and gravel used in construction of the Friant dam. As the excavation gets nearer bed rock, the recovery is greater and is said now to be about $20,000 per month. The dam contractor gets 50 percent of the net proceeds and the Federal Government the other 50 percent. Recently two workmen in the gold recovery part of the aggregates plant were arrested, charged with stealing $6,000 in gold. They had attempted to dispose of it to the U. S. Mint through confederates, who represented the gold as coming from a claim on the American River; but the tell-tale fineness of the gold dust made the secret service agents suspicious. Walter B. Lenhart, our West Coast editorial representative, says it is the first case on record of "high grading" at a sand and gravel plant.

Washington, D.C.: U. S. Maritime Commission invited some 20 concrete construction officials to participate in a conference here August 8 to see what could be done about building reinforced-concrete tow barges for oil and other bulk cargoes. For the present the Maritime Commission expects to limit consideration of concrete construction of tow barges; dimensions: a length of about 350 ft. on the waterline, a beam of 45 to 50 ft., a draft not in excess of 30 ft. when loaded. It is desired, is possible, to carry at least 6,000 tons deadweight per barge. To eliminate so far as possible all expensive and complex equipment, these barges will be designed to operate without personnel on board. The Commission, in its invitation, made it plain that it was not prepared to furnish funds for construction of yards or machinery for this program - but it is ready to discuss any plans that may be submitted.

Chicago, Ill.: We didn't know it when the editorial in the August issue on "The Future of Cement and Concrete" was written, but we have since learned that the New Deal administration actually has public works projects to the sum of 25 billion dollars pigeon-holed for the post-war emergency. So we see no end of the emergencies that it promotes and nourishes nor any end to the future demand for cement and aggregates.

Washington, D.C.: A new $195,000,000 defense highway bill has already been approved by the Senate, to take the place of the one vetoed by the President, who objected to federal aid method of distributing part of the funds. The President wants a free hand in spending the money. The Senate over-rode the President's veto of the first bill, peeved because he accused the Congress of wanting to make it a "pork barrel". However, the House sustained the veto by a small margin. It is expected the new bill, drawn according to the President's desires, will be enacted shortly.

The Staff

When BIG Production is needed!

RAYMOND ROLLER MILL

Capacities up to 40 tons per hour

SINCE 1887

With Whizzer Separator

With Drying System

High Side type shown with double whizzer separator, providing wide range fineness control by simply changing speed of revolving whizzer blades while mill is running. May be operated as a Kiln Mill for drying and grinding simultaneously.

While every industry is forcing plant capacities to an all-time maximum, Raymond Roller Mills are in there doing a great job in maintaining record rates of production on limestone, phosphate rock, gypsum, bauxite, barytes, kaolin, bentonite, fullers earth and other essential non-metallic minerals.

Raymond mills are built as standard units in a wide range of sizes and types: Low Side and High Side, with whizzer or cone separator, with or without drying systems, and with close fineness control up to 99.9% through 400-mesh. Oil journals, high grade bearings and finely engineered construction throughout keep down costs of operation and maintenance.

Write for Catalog No. 33

RAYMOND PULVERIZER DIVISION
COMBUSTION ENGINEERING COMPANY, INC.
1307 North Branch Street CHICAGO
Sales Offices in Principal Cities • • • In Canada: Combustion Engineering Corporation, Ltd., Montreal

Where the ROCK PRODUCTS INDUSTRY Gets Its STEEL

Ten Well-Stocked, Strategically-Located Ryerson Plants for Prompt, Dependable Service

Steel vitally needed for maintenance of America's rock products industry is ready for immediate shipment at Ryerson! In the Ryerson stocks are more than 10,000 kinds, shapes and sizes, including many of the special steels used in the rock products industry.

Even today, with steel diffcult to obtain because of the National Defense Program, Ryerson continues with its Certified Steel Plan. Naturally, many sizes and certain products are out of stock, however, for the most part you can depend on Ryerson for immediate shipment of a wide range of steel products.

The Ryerson Certified Steel Plan is of particular value in the case of alloys where chemical content, physical properties and other characteristics must be known with certainty in order to insure the best heat treatment response in the shortest possible time.

Whatever your steel requirements, phone, wire or write the nearest of the 10 conveniently located Ryerson plants. For best service during the period of heavy demand, "open" orders are advisable. Stock List sent promptly on request.

RYERSON PRODUCTS INCLUDE:

Structurals
Bars
Plates (15 kinds)
Sheets (25 kinds)
Strip Steel
Alloy & Tool Steels
Stainless
Shafting
Mech. Tubing
Boiler Tubes
Welding Rod
Babbitt, Solder
Reinforcing
Nails, Rivets, etc.

Joseph T. Ryerson & Son, Inc., Chicago, Milwaukee, St. Louis, Detroit, Cincinnati, Cleveland, Buffalo, Boston, Philadelphia, Jersey City.

RYERSON *Certified* STEELS

RYERSON CERTIFIED STEELS

WHO IS GOING TO SACRIFICE WHAT?

PRIORITIES are to deprive many small manufacturers of the means of continuing business. Prices are to be fixed on basic commodities, but *not* the prices of agricultural basic commodities, that enter food and clothes, hence the most important prices in determining cost of living. Prices are to be fixed, but not *wages*, the price of labor, which are prime factors in *all costs*, hence the prime factor in all prices. Prices are to be fixed, but taxes of all kinds, which are now large factors in cost, and hence of price, are to be greatly increased. Wage increases are justified by the chief price fixer because of increased cost of living.

Yet, from the President down, every one gives lip service to *patriotic sacrifice*. After more than eight years trying to make people believe that spending was the way to prosperity, and giving an example of the biggest governmental spending spree in all history, the people are asked by their government to become suddenly thrifty and to buy defense savings stamps and bonds. They are not, in anything like the amount desirable or necessary. They are bidding higher and higher for constantly smaller and smaller stocks of consumer goods—silk stockings, radios, cars, etc.

Men in the services complain bitterly about extention of their term of service. Their morale is admittedly low. Some of them are camped in Southern swamps, and few are being taught the technique of modern war; largely because there is little equipment and incompetent instruction. Their morale isn't helped by incidents like that of the general on the golf course with the girls in shorts, nor by pictures of the President's sons, in uniform, who when not with their daddy as witnesses of historical events, apparently spend summers, as usual, at New England resorts.

The President complains that industry and the people generally don't realize how serious the situation is; how necessary to get on a war footing immediately; yet a ship-yard strike can't be touched until he returns from a sea excursion. All of us as well as he can see a lot of things that must be done, some vital decisions that must be made; but he will not permit them to be made except by himself.

What to do about it? First of all we have got to accept the conditions without hope of an early change. We have got to quit beefing, soldiers and citizens alike, and get down to our own small parts in the picture, and do that part to the best of our abilities. Whether we are going to enter a fighting war or not, we want our soldiers loyal and patriotic. If army training can't do anything else it can turn out better Americans.

We can all try to instill thrift and patriotism in those we may influence. We know that if we do not save and help finance the defense effort voluntarily, enforced saving, or holding back, a percentage of wages and salaries, to be paid after the war, is in the offing; and that's not the American way. We can help them to see that present extravagance and high living are contributing to break down the morale of our compatriots in the service.

Most of all we can help show that the course union labor is pursuing, although entirely understandable, is utterly selfish and unpatriotic. If not halted, it will lead to repressive measures on the part of government, absolutely necessary to save society as a whole, that will set back recent gains of labor by many years —if not forever. It will drive society to state ownership and control, which, while always made to look attractive to labor, inevitably results in reduction of the worker to relative slavery. The ultimate beneficiary is never the worker; it is the government, as represented by the managers, the bureaucrats and the politicians. Look at what happened to organized labor in Russia, Germany, Italy, France, Japan. Do we want to prepare the way for the same course in the United States?

Then, too, we can strengthen the hands of our Members of Congress. The big issue is not whether we are going into the war or not. Every sane man realizes we are in it now. If we are not fighting, it is merely because the time and place to start have not been auspicious. We believe the President sincerely wants to postpone that time as long as he can, and avoid it altogether if he can. Instead of badgering the President on this the Congress would be better employed in trying to cut down unnecessary expenses of government, initiating intelligent legislation to meet threatened inflation, to meet the threat to our republic from the excesses of organized groups of both farmers and labor. Congressmen, like all men, are not inspired to take heroic, or even public-spirited, attitudes by constant ridicule and contempt. Their constituents should be as ready to applaud and encourage as to criticize and condemn.

Nathan C. Rockwood

NEWS AND COMMENT

A Practical Joke?

THE POSTER reproduced herewith is one of series issued by the O.P.M. It does not appear to have attracted the attention it deserves. It looks to us like a monkey wrench in pro-

AMERICA'S ANSWER—PRODUCTION . . . This 30-by-40-inch poster in full color is the second of a series to be issued by OEM's Division of Information for defense plants throughout the Nation. The first is reproduced on the cover of this issue.

duction! According to most commentators, it fits the Washington picture admirably.

Government Loses Suit

THE DEPARTMENT OF JUSTICE has lost in the United States District Court at New York City an important anti-trust suit against the manufacturers of so-called "hardboard" (fibre board, not gypsum wall board). The government attorney promised to appeal.

Defendants in the action were the Masonite Corp., Celotex Corp., Certain-Teed Products Corp., Johns-Manville Sales Co., Insulite Co., National Gypsum Co., Flintkote Co., Wood Conversion Co., Armstrong Cork Co. and Dant & Russell, Inc.

The background of the case dates back to 1929, when the Masonite Corporation brought a patent suit against Celotex Company. The former company won and subsequently Celotex became an agent of it. In the following years, agency agreements were made between Masonite and the other defendants. The government contended the agreements were illegal compacts.

In his opinion, Judge Coxe wrote: "Whatever monopoly the Masonite Corporation has in the production and sale of hardboard is derived from the ownership of the Mason patent, and I find nothing in the evidence to show that it has misused any of its patent rights or violated any provisions of the Sherman or Clayton anti-trust laws."

A somewhat similar anti-trust suit is pending against the manufacturers of gypsum wall-board, operating under patent licenses from the U. S. Gypsum Co.

Federal Cement Specifications

THE COMMITTEE on cement, lime and plaster, Federal specifications executive committee, Procurement Division, U. S. Treasury Department, of which P. H. Bates, Bureau of Standards is chairman, has made some changes in cement specifications, to become effective in November. These are (1) making a 2-in. cube the preferred specification for determining tensile strength, and (2) requiring the autoclaving of 1x1x10-in. neat cement bars as the test for soundness.

The autoclave test will be conducted in steam at a gage pressure of 295 lb. sq. in. for 3 hours, acceptability of the cement being manifest by an increase in length not greater than 0.5 per cent.

In the older specifications the tensile strength of briquettes and the compression test of 2-in. cubes were alternate options with the briquette test preferred. The old requirement for soundness was determined by steaming of neat cement pats.

In addition the new specification (SS-C-1916) for normal portland cement has a more rigid requirement for fineness in that a specific surface of 1,600 sq. cm. per gram is now being required, which is an increase from 1,500 sq. cm. per gram.

Magnesium Plant For Defense

DEFENSE PLANT CORP., a subsidiary of the Reconstruction Finance Corp., has supplied Basic Refractories, Inc., Cleveland, Ohio, formerly Basic Dolomite, Inc., with $63,000,000 for a magnesium plant near Las Vegas, Nev. Basic Refractories, Inc., will build and operate the plant for the government as a defense industry.

Plans call for building a ten-unit plant. Each unit will have an annual capacity of 11,200,000 lb. of magnesium so that the total annual output of the plant will be 112,000,000 lb. Employment required for operation of the plant is estimated at about 4,000 workers.

The plant will use electric power from Boulder Dam and will be about 300 miles from magnesite deposits in Nye County, Nevada, estimated to contain more than 55 million tons of magnesite, which are partly leased and partly owned in fee by Basic Refractories.

From these ore bodies, Basic Refractories now obtains some of the minerals including brucite used in its production of various types of refractory materials for the steel industry.

War and English Sand and Gravel Industry

THE CHAIRMAN of Thames Grit and Aggregates, Inc., London, England, had this to say to the corporation shareholders, in reporting on 1940 operations:

"Trading during the year has been hedged about with many difficulties which, however, are not peculiar to this company, or to this industry. The adequate repair and maintenance of plant, machinery and lorries (motor trucks) has been the cause of constant anxiey, but the loss of time from mechanical breakdown has shown little increase over the previous year, a fact that speaks very highly for the efficiency of the management. As might be expected, the costs under this head have risen, and are still rising, particularly in the case of motor vehicles, which we are forced to retain long after their economical life has ended, owing to the great difficulty in obtaining permits to purchase new lorries. This situation, aggravated by the great scarcity of mechanics, and the difficulty in obtaining spare parts, constitutes a handicap which I fear is frequently overlooked by those whose duty it is to enforce the countless, and in many cases, trivial regulations which beset operators of mechanical transport.

"If you will turn to the Consolidated Profit and Loss Account you will observe that the Trading Profit for the year amounted to £43,270, an improvement of £5,509, and the net profit, after providing a sum of £29,830 for Income Tax and National Defence Contribution (an increase of £10,354 over the figure provided last year) amounts to £13,453, a decrease of £4,514.

"Taxation absorbs approximately 70 per cent of our Trading profits. This high ratio is in large measure due to the fact that the Inland Revnue decline to allow the wastage of

our assets as a charge against the profits which are assessable to Income Tax. The value of the land excavated during the year was £3,922, and with Income Tax at 10/- in the £, the provision of this sum required £7,844 of our Trading profits.

"It is impossible to formulate any indication of the trend of trade during the current year. In wartime the probability of marked fluctuations in the demand for aggregates must be faced, so we shall still have to look —and to an increasing degree — to other channels of activity for no inconsiderable proportion of our earnings. In this connection I think I can say that we have explored every avenue which seemed to offer favorable opportunities for the employment of the Company's equipment and organization. The accounts we are reviewing today reflect, in no small degree, the result of this policy."

Whopping Big Mills

IRELAND (or Eire) is making practically all its portland cement requirements at two cement plants built in 1938. The capacity of the larger plant, at Drogheda, has since been doubled. The other plant is at Limerick. The combined capacity is somewhere around 350,000 tons (British tons of 2,200 lb.) per year, equivalent to about 2,000,000 bbl. The plants, belong to Cement, Ltd., and were designed and erected under the supervision of F. L. Smidth & Co., Ltd., London, England.

The following details are from a paper by B. K. Olsen, chief engineer, given in the May, 1941, isues of *Cement and Lime Manufacture* (London, England): The Drogheda plant is served by a limestone quarry and a shale quarry, some distance from the plant, the limestone being brought in by a 2-cable ropeway (cableway) 2¼ miles long. After passing through a jaw crusher and hammer mill, the stone and shale are fed to wet-grinding mills 8x59 ft.—five compartments. The mills carry a ball charge of 100 tons and are driven at 20 r.p.m. by 1,400-B. hp. auto-synchronous motors. Their capacity is estimated at somewhere near 50 tons per hr.

The kilns (now two) are 12x423 ft., fired by air-swept coal mills, which dry and grind at the same time. The fuel ratio is said to be 25 percent or 1 to 4. The rated capacity of a single kiln is said to be 2,500 bbl.

The clinker grinding mills are similar to the raw grinding units, driven by 1,250 B. hp. motors.

The Limerick plant is a smaller, single-kiln operation. The finished product of this plant has to be trucked two miles to rail and water shipment.

British Prison for Refusing Quarry Work

AT RICHMOND (in England) recently a Swaledale man, James W. Calvert, of Whitaside, Low Row, was sentenced to three months with hard labor for failing to take up employment at a quarry as directed, says our British contemporary, *The Quarry Managers' Journal.*

It was stated that a direction was served on Calvert to begin work at a certain quarry. Calvert said that he was unable to leave his smallholding. He had been drawing unemployment pay for almost 12 years, and was registered as a quarryman. He had said that the quarry was too far from his home.

Witnesses said Calvert had always looked upon the smallholding as being subsidiary.

Calvert said he was not an experienced quarryman and could not leave his smallholding under 12 months. He had had jobs, including shepherding.

Canadian Gypsum Industry

FURTHER DEVELOPMENT of the Canadian gypsum industry has resulted in renewed interest in the local manufacture of tiles, wallboard, blocks, and acoustical plasters. Lack of shipping space has seriously curtailed shipments to Great Britain, and as a consequence financial interests are considering the establishment on this side of the Atlantic of British industries formerly taking the material. The United States and Great Britain, particularly the former, heretofore have consumed most of the Canadian supply of crude gypsum.

She Deserves It!

A NEWS ITEM from Hannibal, Mo., says Miss Mary Wiehe of that city received a master of arts degree at Iowa University for a thesis which included an oil painting about 4 x 5 ft., entitled "Cement Packers." The *Hannibal Post* says: "Before leaving for the university Miss Wiehe spent several days sketching at the Universal Atlas Cement Co. plant, being conducted through the plant by R. E. Hoffman, superintendent, and members of his staff, Harold Schnitzlein, operating department, H. C. Wells, quarry department, and J. H. Temple, of the sacking department. After these trips, made possible by Mr. Hoffman, Miss Wiehe chose the cement sacking department for the final painting.

"After painting several weeks Miss Wiehe returned to Hannibal and took photographs and made additional sketches. In both Miss Wiehe's written and oral defense of her thesis the "Cement Sackers" she gave a history of the huge plant on the banks of the Mississippi. Miss Wiehe stated that the university had never had such scenes used before and was greatly interested in the subject."

ADVENTURES OF SUPER DAN, THE SUPERMAN

COME ON RASTAS, WHAT'S THE BILL FOR HANDLING THAT STONE
WELL, BOSS, I FIGURES IT DIS WAY. THREE COME AND THREE GOES, AT FO' BITS A WENT THREE BUCK'S

Hints and Helps

★ FOR SUPERINTENDENTS ★

Cleaning Sticky Material Off of Conveyor Belting

AT CHERAW, S. C., Becker County Sand and Gravel Co. is handling, from its pit, material that is unusually

Spray pipe to clean sticky material from conveyor belt

sticky and hard to handle. A 36-in. belt conveyor, 300-ft. centers, carries the pit run material from a truck hopper to the head of the screening plant. The material has a tendency to stick to the belt.

At the head pulley of this belt, a 1-in. diameter section of water pipe, equal in length to the belt width, has been placed cross-wise to the belt and under the center line of the head pulley so as not to interfere with the belt discharge stream. The pipe is perforated to direct a uniform spray of water against the belt under 25 p.s.i. pressure to wash off the sticky material that clings to the belt.

Clear Visibility in Loading Cars

IN BUILDING a new crushed stone plant at Greystone, N. C., the Raleigh Granite Co. installed used perforated screen plate as the floor of a loading tipple. The plant is designed with open bin storage from which stone is withdrawn by an inclined tunnel belt conveyor in loading cars or trucks.

This tipple has a 16- x 24-ft. floor extending over two car-loading tracks. The head of the tunnel belt conveyor, the pants-leg chute which is used to load directly into cars on either track, and rinsing stationary screens in each chute, are entirely enclosed above the floor.

The entire floor is of perforated plate of various sizes up to 2½-in. size openings, which permits air circulation and simplifies the operator's job. He can look down under the tipple without effort into each corner of the car on either track and see exactly how it is being loaded and when it needs to be respotted.

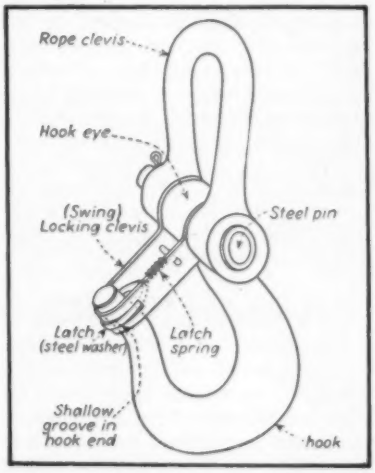
In the winter months, strips of old conveyor belt are to be laid over the plate to form a continuous floor that helps protect the operator from the cold. With such a permanent loading out tipple, it is a simple matter to take samples while loading cars. There is a separation in each loading chute about 2½ ft. above the perforated floor through which a sample pan is quickly passed by turning it on a vertical shaft to catch a representative sample from the loading stream.

Safety Hook

IN THE ACCOMPANYING ILLUSTRATION is shown a safety hook used in hoisting operations which has been found very satisfactory by its users. An illustrated description of this hook appeared in *Engineering and Mining Journal,* and is being reproduced, herewith, as it should find many applications in the rock products industries.

It is made up of a strong steel hook, a U-shaped steel locking clevis, a simple locking mechanism, a rope clevis, and a steel pin. The lock mechanism comprises a latch in the form of a steel washer fastened to the small spring on the cross pin of the locking clevis and resting in the shallow groove near the end of the hook when in the closed position.

The safety hook can be made in any blacksmith shop, and provides a positive lock mechanism preventing accidental opening. The locking clevis also reinforces the hook. Although the latch of the lock mechanism may be opened easily with a gloved hand simply by pulling it outwardly until

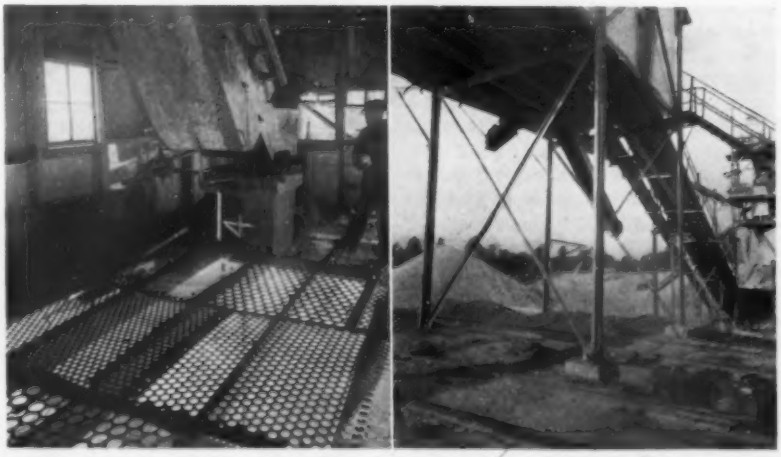


Safety hook which may be easily opened by hand, but which accidental blows will not open

the groove in the hook end has been cleared, pressure or blows from one side only will not open the latch.

Spotting Railroad Cars

IN FILLING A LARGE CONTRACT for stone aggregates, a southern operator of crushed stone quarries uses an R.D.6 Caterpillar Diesel tractor for spotting cars, which are loaded direct from stockpiles by belt conveyors.



Left: Loading out tipple, all enclosed, with perforated plate flooring to permit looking down into cars. Note sampler on swivel, to the left. Right: Looking up to tipple, car loading belt to the right

This tractor is tied by cable to a car and can easily handle a number of cars coupled together, which are pulled consecutively under the loading point. A car is loaded every 15

Tractor used to "spot" cars under loading spout

minutes by this plant, using similar equipment with bull-dozers to load the belt conveyor from stockpiles.

Novel Method of Rock Haulage and Storage

By SCOTT MILLIGAN
Muncie Stone & Lime Co., Muncie, Ind.

IN 1933 WE DISPOSED of our quarry pit shovel and instituted the unit system of rock loading and haulage. For this purpose seven skips, or buckets, for hand loading of stone were placed in service in the quarry.

We are now using ten of these skips, each having a capacity of about 2¼ tons of broken rock, for loading and hauling from the pit floor. Three Ford trucks, any of which can take care of six skips, are used for haulage. In addition, there is also a 4-ton skip that we use for transporting material from the crushing plant to storage and from storage to point of use. This large skip can be used with any one of the three trucks, the complete unit answering the purpose of a dump truck.

The trucks carry the skips to the crushing plant, where they are unloaded by tipping and lifting the tail gates—all movements, including lifting the loaded skip, unloading it at the plant, and returning it to the quarry pit floor, being performed by the truck operator without leaving his seat.

Pants-leg type of car loading chute. Inset shows how material is shunted from one leg to the other in loading a second car without shutting down conveyor

In the quarry large rocks are broken by means of a jack hammer to sizes that are readily handled into the skip. For the drilling of blast holes, a Clipper drill is used. Blast holes are 30 ft. deep and are spaced 19 ft. apart with 10-ft. burden.

Storage includes concrete aggregates in various sizes as well as agricultural limestone. Stockpiling is done along one side of the quarry where the trucks can dump from the edge of the pit, forming a pile about 25 ft. high against the face of the pit. A ramp leads from the top of the pit to the bottom of the pile, where trucks coming in for rock can be loaded by means of a ⅜-cu. yd. Insley type shovel or a Barber-Greene loader. This system of storage obviated the need for loaders or cranes to carry the rock to the top of the pile, and saves ground space.

In an effort to reduce the cost of rope replacement on the Insley shovel, several years ago we installed our first Tru-Lay (preformed) ropes as hoist and swing lines. So remarkable an improvement was noticed in rope life that we have now standardized on preformed rope for these applications.

Continuous Loading of Railroad Cars

BECKER COUNTY SAND AND GRAVEL Co., Cheraw, S. C., is shipping as much as 60 cars of gravel daily for the construction of the Santee-Cooper power project near Charleston. Sized aggregates are reclaimed from open bins, in loading cars, by a 36-in. tunnel belt conveyor, 160-ft. centers, that transfers to a 36-in. belt on 150-ft. centers for direct loading into cars.

At the railroad, the gravel from the belt conveyor discharges into a 2-way chute, or pants leg, and can flow through either "leg" into a railroad car. The interesting part of the 2-way chute is that material can be passed through either of the two by opening or closing a lever-controlled gate.

The advantage is that when one car has just been filled, the belt conveyor need not be stopped when starting to fill another car. The cars are coupled together when dropped down to the tipple. Gravel is loaded through the forward "leg" until the forward car is filled up to its back end. Then the other leg is in position to start filling the empty car coming up. The forward chute gate is closed by lever, and the other is simultaneously thrown open, making it a continuous operation. After the second car is moved forward enough the gates are thrown back to the original position and the operation is repeated.

Left: Truck backing up, automatically attaching loaded skip. Center: Loaded skip on truck ready for travel. Right: Large stocking and delivery skip dumping its load into stockpile

NEWS ABOUT PEOPLE

CHAS. T. RABER, new superintendent and chemical engineer of the Glens Falls Portland Cement Co. plant in Glens Falls, N. Y., has had a long career in the cement business, beginning at the age of 14 as inspector and car checker for the Coplay Cement Manufacturing Co. He was a charter student in the Pennsylvania State College Extension School in Allen-

Chas. Raber

town, continuing his studies while employed. In 1918 he joined the reserve engineers at Washington Barracks, D. C., and was selected to go with Cement Mills Company No. 1 of the A.E.F. to manufacture cement for the Allies. During the war period he was stationed at Mortagne-sur-Gironde, France, as assistant chemist and attained the rank of sergeant. Mr. Raber is also a member of Committee C-1 of the A.S.T.M. and of the Technical Problems committee of the Portland Cement Association. He was born in Mechanicsville, Lehigh County, near Allentown, Pa., on January 15, 1893.

•

DONALD E. ENNIS, the new assistant superintendent of the Glens Falls Portland Cement Co., Glens Falls, N. Y., is a graduate of Union College of the Class of 1916. After leaving college he started to work for the General Electric Co., becoming assistant general foreman of the testing department at Schenectady in 1923. When the Glens Falls Portland Cement Co. changed its power to electricity, he assisted in electrifying the plant, and became electrical engineer of the company. Mr. Ennis has been safety engineer for a good many years and is still in that capacity besides his duties as assistant superintendent.

•

HORACE T. HUNTER, president of the MacLean Publishing Co., Ltd., Toronto, Ont., parent company of the Tradepress Publishing Corp., which publishes ROCK PRODUCTS, will be the

Horace T. Hunter

keynote speaker at the opening session of the Toronto Conference of the National Industrial Advertisers' Association, September 17. His subject will be "Industrial Advertising in a Wartime Economy."

•

HENRY O. REGNER has been elected vice-president and treasurer of the Northern Gravel Co., West Bend, Wis. J. C. Buckbee of Los Anglees, Calif., is president.

R. L. STEWART, chemical engineer, well-known in the cement industry, has returned from Venezuela, South America, where he has been engaged in consulting work.

•

HUGH O. MELOY has been appointed superintendent of the Standard Portland Cement Co., Painesville, Ohio, succeeding Harry C. Stevens, deceased. Mr. Meloy, who is 37 years of age, has been continuously employed in the cement industry since leaving Purdue University, Class of 1927. He was born in Sellarsville, Indiana.

•

E. N. BROOKS has been elected president of the Brooks Equipment & Manufacturing Co., Knoxville, Tenn., succeeding his late brother, Wallace Brooks. The new president was founder of the firm, which manufactures pulverizers, rock crushers, and road building equipment. He was executive vice-president and general manager until his brother's death a short time ago. Karl R. Martin, former secretary, has been named executive vice-president and treasurer, and Mrs. D. B. Kirby succeeds Mr. Martin as secretary. Other officers are: R. S. Tucker, vice-president in charge of sales, and Richard Howes, assistant secretary-treasurer.

•

WILLARD V. MERRIHUE, manager of apparatus, General Electric Co., Schenectady, N. Y., will address the National Industrial Advertisers' Association, in Toronto, Ont., September 18 on "The Planning, Execution and Results of the G.-E. Tri-Clad Motor Campaign—A Story of All-Out Pro-

Willard Merrihue

motion." The campaign included a spectacular road show, a complete performance of which will be put on as a part of the presentation.

Surplus Gravel Reduced to Sand

Impact crusher produces desirable gradations of sand with the aid of vibrating screens and classifiers

Impact type crusher to produce manufactured sand

CRUSHING BY IMPACT, or actually throwing gravel or stone at high velocities against breaker plates, is the newest development in crushing aggregates. A number of these new-type machines have been installed in gravel and crushed stone plants in the last year or two where they have been applied in a variety of ways on different materials. A fair measure of their success as crushers depends on the characteristics of the stone and for what purpose they were installed.

Some of these crushers are being used to eliminate soft stone and others as reduction crushers because their design is based on a crushing principle intended to produce a uniformity of shape with freedom from elongations and slivers. In other plants they are making chips, producing stone sand or crushing gravel into a manufactured sand.

Performance of the various installations must be evaluated on the individual plant's experience and in the light of the value derived in terms of customer acceptance, the conversion of surplus stocks into products that have a market and other more important factors than the usual yardsticks, such as capacity, cost of operation, maintenance, etc.

Evidence indicates they do produce a desired shape of particle when fed a variety of types of materials, and crushing by impact does break down soft materials. They have large capacities considering their smallness, and the range in size of the material they crush need not fall into a close size range. Other experience data depend on the adaptation and can best be illustrated by discussing a particular installation.

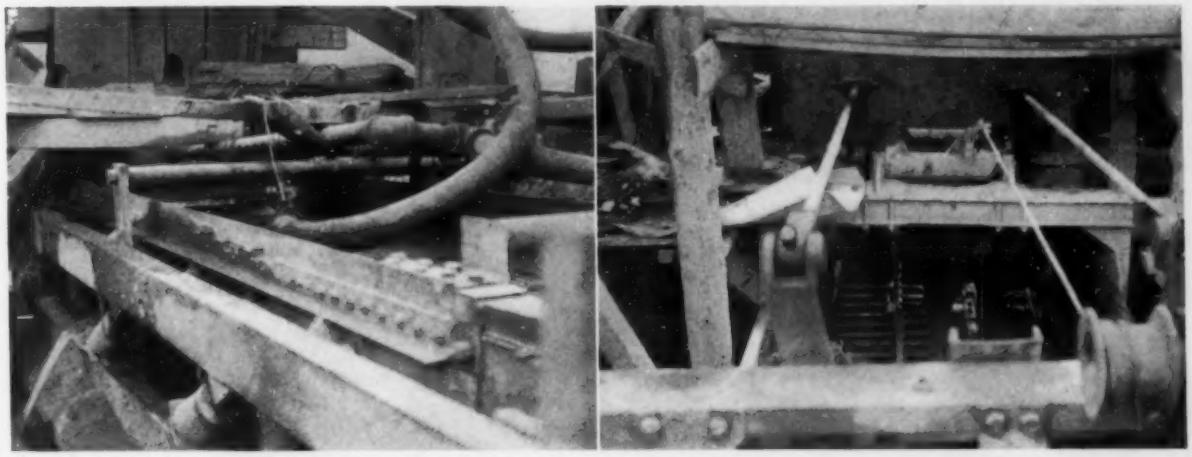
Reduce Gravel to Sand By Impact Crusher

Susquehanna Sand and Gravel Co., Inc., Highspire, Penn., just outside Harrisburg, has been operating one of these machines, a Symons impactor, for several years. In this particular installation, the machine was purchased to produce a manufactured sand from various sizes of hard, siliceous gravel. There had been very little market for crushed or uncrushed gravel as such, so it was a matter of making sand for which there is a market.

This plant was built some 10 years ago, and until recent years had operated a pit deposit containing about 65 percent gravel and the remainder sand. Due to market conditions, a stockpile had accumulated over a period of years running between 400,000 and 500,000 tons, of which about 90 percent is gravel, ranging in size from natural concrete sand up to cobble sizes. Much of the sand in the stockpiles is the result of an approximate split in sizing during production.

In preliminary attempts to convert this gravel into sand, capacity was insufficient and costly, but the present arrangement produces 450 to 500 tons of combined natural and crushed sand in 10 hours. Incidentally the gravel pit was not operated one year and all the production was from stockpiled material.

In producing from stockpiles, trucks haul six tons to a load of this material to a hopper, from which



Left: Sizing screen to separate out natural sand from gravel to be crushed. Right: Reciprocating rakes for dewatering final product which is partly crushed and uncrushed sand

it is fed by belt conveyor into a 10- x 20-in. Traylor jaw crusher. A 2-in. grizzly over the crusher by-passes the fine material to join the crushed product stream into a bucket elevator feeding a 4- x 18-ft. screen which has a 4-ft. scrubber section.

Water is added in the scrubber section and a sand jacket takes out all 5/16-in. minus material which is fed by a chute into a Dorr twin-rake classifier. Three gravel sizes are produced in case of a demand, but much of the time they go direct to the impact crusher rather than into the bins. In that case the bins serve as surge storage. Sizes produced are 5/16-in. to 1-in., 1- to 1¼-in. and 1¼- to 2½-in.

Tailings are plus 2½ in. all the way up to seven or eight inches, and even larger in size. Tails are always fed to the impact crusher, and often are supplemented by the sized gravel. Any gravel grade or combination of sizes comprise the feed into the impact crusher, bin chutes from the four sources of material converging on to a single belt conveyor.

The conveyor empties into an inclined chute which feeds into a vertical spout with a drop of 14 ft. 6 in. into the crusher. A picker catches sticks and cobbles over 8 in. in size at the head of the vertical spout. Much of the time the impact crusher receives a feed ranging from 5/16-in. up to 7 in. in size in a wet condition. Bulk of the feed averages about 1½ in.

The impact crusher is a 26-in. machine (diameter of rotating mechanism) and is installed on the ground level. Its drive is a 60-hp. motor through V-belt but the average power input is 45 to 50 hp. Speed of rotation is kept at 1890 r.p.m. Reduction is accomplished by throwing the gravel against three 5- x 11-in. manganese steel breaker plates, 2 in. thick.

Discharge from the impact crusher is elevated by bucket elevator and put over a single-deck 3- x 10-ft. Symons horizontal screen which is located higher in the plant structure than the natural sand classifier mentioned previously. A water stream is played on the material in such a direction as to slow its travel over the cloth and a separation is made over 5/16- x 1-in. spring steel cloth. Throughs enter the same classifier that receives the uncrushed sand and the overs return into the crusher by way of the belt bringing fresh feed to it.

Separate the Sand Sizes With Rake Classifier

Regulation of the fines from the combination crushed and uncrushed sand is done by adjusting the tailboard height of the rake classifier and the quantity of water put into it. Finished sand, which is a blend, discharges from the rake classifier into a bin. Its normal gradation, when producing regular highway sand, averages 100 percent minus the No. 4 sieve, 60 percent minus No. 16, 15 percent through No. 50 and 3 percent through the 100, with considerable latitude on the fine side for producing federal and other specifications.

Overflow from the rake classifier is laundered to a sand drag where masons sand is produced from it. This sand is stored in open stockpiles and is not included in the tonnage given for the plant.

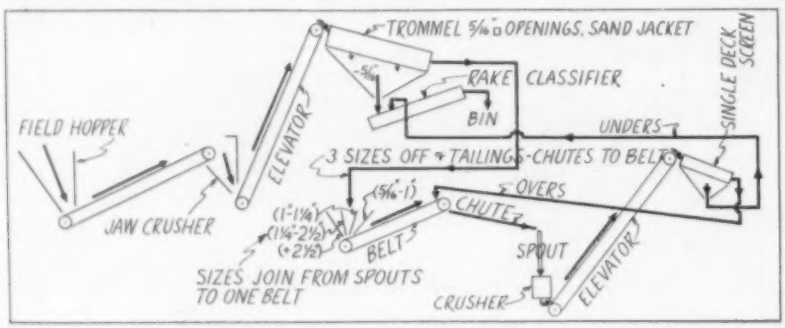
Operating Cost and Capacity of Impact Crusher

Average feed into the impact crusher is 35 to 40 tons per hour and average output 20 tons per hour, which means that a circulating load of 75 percent to 100 percent is carried. Wear on the breaker plates influences capacity to some degree and the circulating load considerably.

Breaker plates have a life of one day. In the morning, with new breaker plates in the crusher, 70 to 75 percent of the feed into the crusher becomes finished product with a single pass through the crusher. This figure tapers off to 50 to 55 percent as noon approaches, when the plates are reversed, the drop off in the tonnage per single pass being proportioned to the degree of wear on the edges of the breaker plates. Cost of replacement of the three plates is $9.00 which is practically all the maintenance chargeable to the daily output, or 4.5c per ton of crushed sand. This figure is halved on the basis of plant output which includes natural sand blended with the crushed.

Circulating loads vary with the rate and size of feed. Larger size feed is desirable for efficiency up to about 2½ in. size on this gravel, when the circulating load builds up too great. In that event, part of the feed can be diverted to a 20-in. Symons cone crusher which discharges on to the same belt carrying material to the trommel screen from the jaw crusher. Breaker plates are changed in 10 minutes.

Occasionally a run is made with a dry feed of picked stockpile stone, free from sand, and in that case the machine's efficiency is greater. On filling occasional gravel orders, the crusher will be used for reduction purposes and the circulating load held down in order to get some larger product than sand. Instead of returning the overs from the horizontal screen into the crusher, they will be taken off as a product size. J. M. Whitlock is president and general manager of the company.



Flow sheet of crushing and screening operations to produce a manufactured sand

Canadian Barite

A REMARKABLY LARGE deposit of barite was reported to have been found recently near Windsor, Nova Scotia, by a mining engineer originally sent out by an Ontario firm to investigate the possibility of this province supplying essential war metals, particularly manganese.

Preliminary diggings exposed more than 200 by 200 ft. of the deposit, and the walls were not yet found. A hole was drilled and it cut through 83 ft. of barite before it bottomed in interbedded barite and red shale. Based on this preliminary work the Deputy Minister of Mines stated that, assuming the drill hole was made through a cone and terminated at its apex, there would be more than 100,000 tons of barite in this one deposit.

That the barite is of good quality is evidenced by samples taken from 14 places within the 200-ft. area. These ranged in specific gravity from 4.32 to 4.45, with an average of 4.41 (specific gravity of pure barium sulphate being 4.48). The composite sample, an average of the 14 samples analyzed, showed barium sulphate 97.1 percent, lime 0.1, ferric oxide 0.7, silica 1.1, and undetermined material 1.0 percent.

Transportation conditions are favorable, as the barite is about 3 miles from tidewater.

NATIONAL ASSOCIATION ACTIVITIES

Laboratory Tests of Aggregates

STANTON WALKER, director of engineering, National Sand and Gravel Association, recently reported on the status of important laboratory tests. Series 39 tests on the Effect of Characteristics of Fine Aggregates on the Durability of Concrete are under way. About one half of the work on the current outline for Series 37 tests on Adhesion of Asphalt to Different Types of Aggregates have been completed. Work continues on Series 34 on the Effect of Physical Characteristics of Coarse Aggregates on the Durability of Concrete.

Sand and Gravel

Executive Secretary V. P. Ahearn of the National Sand and Gravel Association has called the attention of the industry to Preference Rating Order No. P-19A, Office of Production Management. This rating differs from P-19 only in that the preference rating assigned to the defense project may be used by the builder and the supplier in obtaining materials and supplies which are "included under the current Priorities Critical List as amended from time to time." Preference ratings assigned under P-19 may be used by the builder and his supplier irrespective of whether the desired equipment and supplies are included on the Priorities Critical List; an application by the builder and his supplier of preference ratings issued under P-19A is confined to items on the Priorities Critical List. OPM will decide, as to a given project, whether P-19 or P-19A should be used in the assignment of preference ratings.

In the case of many sand and gravel companies there are contracts for the direct servicing of defense projects. Those companies have a procedure open to them for the obtaining of preference ratings, if equipment and repair parts are needed which cannot be obtained through normal commercial channels. They may utilize the extendability features of P-19 or P-19A; they may file a PD-1 application for new equipment or for repair and maintenance parts which are needed to insure the continuity of production and distribution; and when OPM issues its complete repair and maintenance order, they will eventually be able to obtain an A-10 rating for parts needed for production and distribution, with particular reference to truck maintenance.

It is expected that OPM will soon announce a program providing for defense housing projects. Preference ratings to be assigned will aid contractors engaged in defense housing work to speed up delivery of materials to be specifically named on a defense housing critical list, now being prepared.

Ready Mixed Concrete

At the last meeting of the Board of Directors of the National Ready Mixed Concrete Association, consideration was given to certain proposed changes in the Tentative Standards for Operation of Truck Mixers and Agitators. As a result, the Board appointed Alexander Johnson, H. F. Thomson, J. L. Shiely, and Stanton Walker to make recommendations. The following recommendations have been made by this committee to the Board: The title was changed to read "Standards for Operation of Truck Mixers and Agitators"; section 1 (b) was omitted; and section 1 (c) which now reads, "These standards and recommended practices are subject to periodic revision as further studies justify such revision," was changed to read, "1(b) These standards and recommended practices are based on the ability of equipment to mix and/ or transport concrete in an acceptable manner from the point of view of quality. They are subject to periodic revision as further studies justify such revision."

Committee to Advise OPM on Non-Metallic Minerals

E. R. STETTINIUS, JR., announced August 15 the creation of a special technical committee to advise the Office of Production Management on nonmetallic minerals.

The new group is a special subcommittee of the advisory committee on metals and minerals which was appointed by the National Academy of Sciences. Clyde E. Williams, director of the Battelle Memorial Institute, Columbus, Ohio, is chairman of the general advisory committee on metals and minerals.

Members of other special subgroups of the advisory committee—ferrous minerals and ferroalloys, metals, conservation and substitution, and tin smelting and reclamation—have already been appointed.

The newly announced nonmetallic minerals group, staffed by some of the country's outstanding specialists in this field, has the following membership:

R. P. Heuer (chairman), General Refractories Co., 1600 Real Estate Trust Building, Philadelphia; Paul Tyler (secretary), United States Bureau of Mines, Washington, D. C.; L. E. Barringer, General Electric Co., Schenectady, N. Y.; B. C. Burgess, United Feldspar & Minerals Corp., Spruce Pine, N. C.; W. S. Landis, American Cyanamid Co., 30 Rockefeller Plaza, New York; G. R. Mansfield, U. S. Geological Survey, Washington, D. C.; Robert B. Sosman, U. S. Steel Corp., Kearny, N. J.

John D. Sullivan, Battelle Memorial Institute, Columbus, Ohio; Frank J. Tone, Carborundum Co., Niagara Falls, N. Y.; William M. Weigel, Missouri Pacific Railroad Co., Missouri Pacific Building, St. Louis, Mo.; M. M. Leighton, State Geological Survey Division, University of Illinois Campus, Urban, Ill.; G. A. Bole, Orton Ceramic Foundation, 1445 Summit St., Columbus, Ohio; R. B. Wittenberg, International Agriculture Corporation, 61 Broadway, New York, N. Y.; Oliver C. Ralston, U. S. Bureau of Mines, College Park, Md.

The new group is now preparing reports for the Office of Production Management on graphite, mica, asbestos and other strategic minerals.

Ahearn and Boyd Talk on Associations

EXECUTIVE SECRETARIES of the national aggregates trade associations were prominent speakers on the Trade Association Schedule of the National Institute, held the week of August 18 at Northwestern University in Evanston, Ill. V. P. Ahearn, executive secretary, National Sand and Gravel Association, spoke on "The Trade Association and Employer-Employe Relations." J. R. Boyd, executive secretary, National Crushed Stone Association, had as his subject, "The Conduct of Expositions as a Function of Trade Association Management."

Pennsylvania Crushed Stone Operators Outing

PRESIDENT JOHN RICE, JR., of the Pennsylvania Stone Producers Association reported that its annual outing on August 7th at the Blue Ridge Country Club near Harrisburg, Penn., was a very enjoyable event.

Sampling in Cement Manufacture

By C. J. MURPHY*

Practice at the Fort Whyte Plant, Manitoba, Canada Cement Co., Ltd.

THE FOLLOWING is a description of the methods employed at this plant to obtain representative samples of the raw materials that are used in the manufacture of cement, and also of the finished product, with a brief outline of the chemical control.

Our limestone quarry is 145 miles from the plant, and has been sampled and analyses made from each 4 ft. in depth at 50-ft. intervals along the entire face. A record of these analyses has been kept for reference. The limestone is sampled several times daily from the kominuter feed tables, and these samples are combined for a composite sample for analysis.

The plant being of the wet process, we take our samples of clay from the clay slip basin twice each day. The water content and specific gravity is determined on each sample, and the water content is marked up in the wash mill for the guidance of the men there for adding water to the clay during attrition. An equal portion of each clay sample is saved for a composite sample for analysis.

Our clay being deficient in silica, we add a high silica sand to correct this. The sand is thoroughly sampled in the cars as it comes to the plant, these samples being for chemical analysis. The sand is ground wet to a fineness around 98 or 99 percent passing the 200-mesh sieve; the water content is usually around 35 percent. The sand sump and storage tank are sampled several times each day, these samples being required to enable a more accurate addition of sand to the mix.

Slurry Record

The results of all samples are entered up on a slurry record sheet as shown in Fig. 1. The tables as shown in Fig. 2 assist in the rapid calculation of the proper amount of sand that should be added to correct the mix. At the present time, we are adding 18 pounds of sand per barrel of slurry. An example of a sand calculation is as follows:

Correcting tank No. 2 has 160 in. of slurry, the water content is 34.6 percent. The tables show that there are 516 bbl. of slurry in the tank, so there are $516 \times 18 = 9{,}288$ lb. of sand to be added. The sand at that time had 33.8 percent water. The sand tables are figured out in even percents, so that 34.0 percent is close enough. This shows that there are 181.0 lb. of dry sand per inch in depth, so $9{,}288 \div 181.0 = 51$ inches of sand slurry to be run over. This method gives very good results. Now, the amount of sand found required in tank No. 2 is run to the tank that is next filling, and so on.

Fig. 3 shows the sand order, our method of figuring a blend of two tanks that are different in CaO and water content, and the run-out order for the blend.

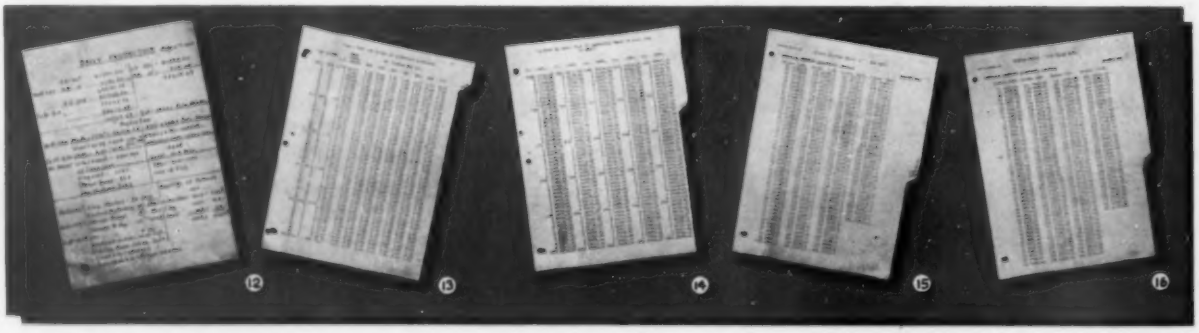
Fig. 4(A) is the sand sampler, the sand being sampled in the sump with this mug. (Air agitation keeps the sand in suspension.) Fig. 4(B) shows the kind of sampler used in sampling the correcting tanks, slurry storage, clay basin and the sand storage tank; separate samples are taken at three different depths in the tanks and then combined for the composite sample.

Fig. 5 shows the automatic sampler at the tube sump. This is where we get our first sample of the finished slurry. This sampler gives good results. It is a V-belt passing around a grooved gudgeon on the end of the screw conveyor; the top sheave is set in guides and is held taut by the counterweight; sufficient slurry is carried up by the belt and falls off at just the right place to fill the bucket each hour.

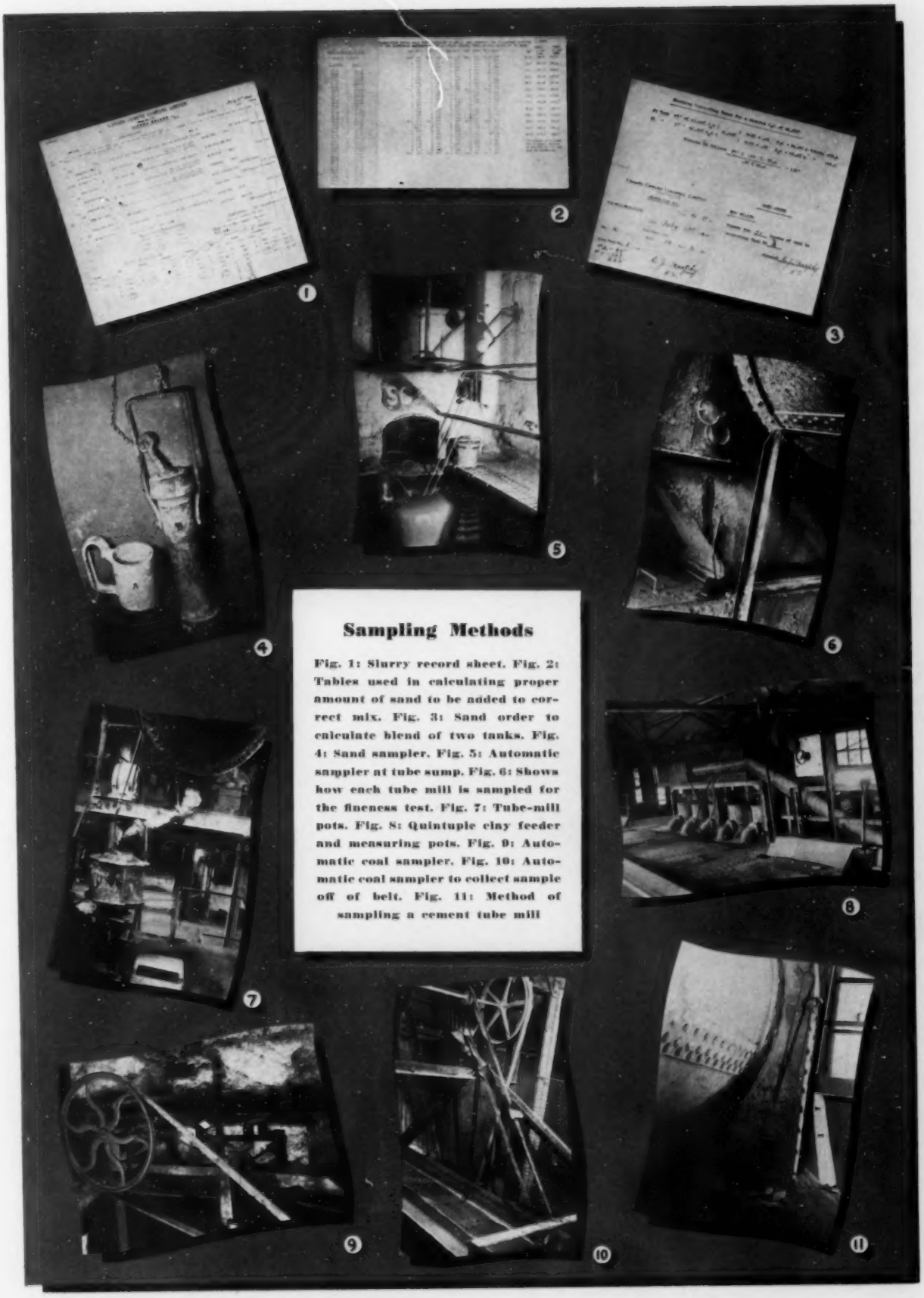
Fig. 6 shows where we sample each individual tube mill for the fineness test. The long-handled dipper is inserted in the opening and held there until the sample is obtained. (Note safety guard to protect men from tube-mill door.)

Fig. 7 shows the tube-mill pots. We time the filling of these pots and record the settings of the marker and the seconds required to fill the pots; if the fineness should drop a little we would cause the pots to fill a little more slowly. The wheel in the upper right hand corner operates a slide to regulate the flow or feed of the

*Chemist, Plant 13, Canada Cement Co., Ltd., Fort Whyte, Manitoba.



Examples of record forms. Fig. 12: Production calculations derived from slurry record. Fig. 13: Amount of slurry required to make a barrel of clinker. Figs. 14, 15, and 16: Other tables required in daily calculations



Sampling Methods

Fig. 1: Slurry record sheet. Fig. 2: Tables used in calculating proper amount of sand to be added to correct mix. Fig. 3: Sand order to calculate blend of two tanks. Fig. 4: Sand sampler. Fig. 5: Automatic sampler at tube sump. Fig. 6: Shows how each tube mill is sampled for the fineness test. Fig. 7: Tube-mill pots. Fig. 8: Quintuple clay feeder and mensuring pots. Fig. 9: Automatic coal sampler. Fig. 10: Automatic coal sampler to collect sample off of belt. Fig. 11: Method of sampling a cement tube mill

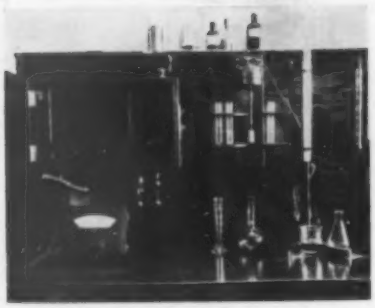


Fig. 17: Set-up of Turbidimeter

tube mill. A stop watch is used for timing these pots.

Fig. 8 shows the quintuple clay feeder and measuring pots. The

Fig. 18: Form for reporting Turbidimeter results

photograph shows 5 pots. In the old system, we used to time the individual pots to regulate the CaO content of the slurry; last year the change was made to a bucket feeder, and it is necessary to time only one pot now.

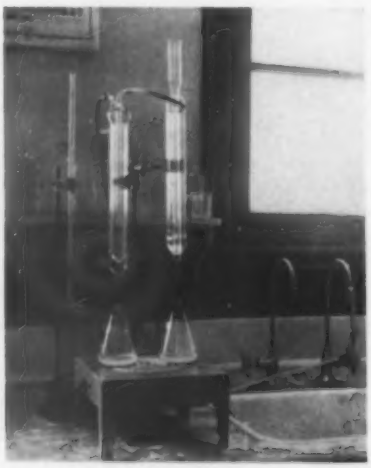


Fig. 19: Shows apparatus for calculating free CaO

When the CaO becomes too high, we make the pots fill faster, and we have them fill slower when the CaO is low.

Fig. 9 shows the automatic coal sampler which collects a sample off the belt and gives us a much more representative sample than could be obtained by sampling cars.

Fig. 10 shows the automatic cement belt sampler. This method of sampling has proved very satisfactory.

Fig. 11 shows the method of sampling a cement tube mill—the iron rod to hold open the trap door, and the long-handled scoop. This method keeps the men on the walkway, and away from being struck by the tube mill.

All our samplers seem to be giving us good results, but sampler (B) in Fig. 4 is quite messy.

Fig. 12 shows the production calculations derived from the slurry record in Fig. 1.

Fig. 13 shows the cubic feet of slurry required to make a barrel of

Fig. 20: Arrangement for agitation of samples for sugar test

clinker at different moistures and at different pounds per barrel. At the present time we are using 565 lb. of raw material to make one barrel of clinker. We have compiled tables to cover quite a range of water content and pounds per barrel.

Figs. 14, 15, and 16 are of more tables which are required in daily calculations.

Fig. 17 shows the set-up of our Turbidimeter, and Fig. 18 shows the form for reporting the Turbidimeter results. Our company carries on comparative tests between the different plants, and all are reported on this form.

Fig. 19 shows our free CaO arrangement, and photograph Fig. 20 shows the arrangement for agitation of samples for the sugar test, the Nessler tubes being held to the spokes by fuse clips. This device for agitating has given satisfactory service.

Improved Dolomite Refractories

FOLLOWING the lead of the Canadian refractories industry in the production of excellent high-calcium magnesite refractories and taking a cue from the producers of technical magnesium carbonate in the separation of the lime and magnesia contents of dolomite, American manufacturers have started production of high-grade basic refractories from dolomite as the raw material. These developments have fortunately been timed to meet the vastly increased demand for basic refractories created by the unprecedented national-defense program now under way. Basic Refractories, Inc., has for several years been manufacturing a basic refractory from dolomite, the magnesia of which is built up by the addition of brucite and serpentine and the lime converted to the orthosilicate, which is stabilized with chrome ore.

The Standard Lime and Stone Co. is also producing a refractory from the product obtained by leaching the slightly soluble calcium oxide from calcined dolomite with large volumes of water. At least two other processes for the production of high-magnesia materials for refractories from dolomite are now under investigation in the pilot-plant stage—one by treatment of the calcined and slaked dolomite with hydrogen sulphide and subsequent extraction with water, and the other by extraction of the calcined dolomite with sugar solution. Another process to which some consideration has been given is the use of the lime content of calcined dolomite for the recovery of ammonia in the ammonia-soda process for the production of sodium carbonate. In this case a high-magnesia sludge suitable for the manufacture of refractories would remain. (Alvin H. Schallis, Bureau of Mines.)

Seek Cement Plant for South Carolina

INDUSTRIAL DEVELOPMENT COMMITTEE, State Council of Defense, is surveying deposits of marl in eastern South Carolina preparatory to selecting a site for a cement plant, according to newspaper reports. The governor is said to have secured the coöperation of the railroads, power companies and large cement interests in the survey and will negotiate with interested groups for the building of one or more plants in the state.

SPECIAL PRODUCTS SECTION

Nodulizing Phosphate in Kilns

Mica—A War Boom Industry

Processing Feldspar for Glass

Making a Finer Rock Wool

No Silica Wasted in this Plant

Large Market for Barites

Fluorspar for Defense

Asbestos to the Front

View of pit from which kaolin containing mica is excavated by scraper and moved to hopper feeding out to belt conveyor leading to plant of Kaolin, Inc., Spruce Pine, N. C.

STURTEVANT

RELY ON . . .

THE STURTEVANT LINE-UP OF PROFIT PRODUCING EQUIPMENT

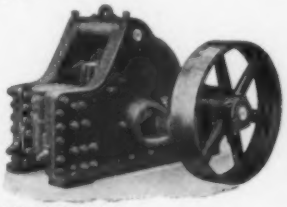
IS YOUR ANSWER TO DOLLAR CONSCIOUS PRODUCTION

AIR SEPARATORS

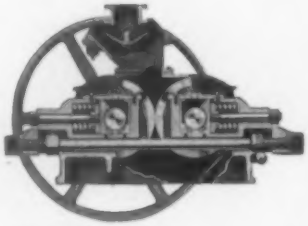
The story of the superiority of Sturtevant Air Separators is best told by their features combined with the large number already used in industry. For portland cement alone over 297 have been sold without a single rejection. And for the other nonmetallics hundreds of Sturtevant Air Separators are also used.

With Sturtevant Air Separators you can be sure of consistent production at any reasonable fineness. Range of work is between 40 and 350 mesh. Capacities can be handled from 1/4 ton to 50 tons per hour at low cost per ton for power and upkeep. Sturtevants have large feed opening, steep cones, and rigid construction. Ball and roller bearings are used.

SWING-SLEDGE MILLS
for coarse and medium reduction. (1" to 20 mesh). Open door accessibility. Soft, moderately hard, tough or fibrous substances. Built in several types and many sizes.



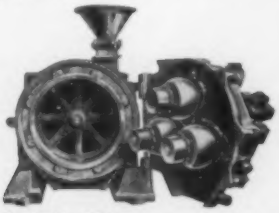
JAW CRUSHERS
for coarse, intermediate and fine reduction of hard or soft substances. Heavy or light duty. Cam and Roller action. Special crushers for Ferro-alloys. Several types, many sizes.



CRUSHING ROLLS
for granulation, coarse or fine, hard or soft materials. Precision and automatic adjustments. Crushing shocks balanced. For dry or wet reduction. Sizes 8x5 to 38x20. Roller or Plain bearings. The standard for abrasives.

ROTARY FINE CRUSHERS
for intermediate and fine reduction. (1" to ¼".) Open door accessibility. Soft or moderately hard materials. Efficient granulators. Excellent preliminary Crushers preceding Pulverizers. Many sizes. Belt or Motor driven.

MOTO-VIBRO SCREENS
screen anything screenable. Classified vibrations. Unit construction—any capacity. Open door accessibility. Open and closed models with or without feeders. Many types and sizes —range of work ½-in. to 60 mesh.



RING-ROLL MILLS
for medium and fine reduction (10 to 200 mesh) hard or soft materials. Very durable, small power. Operate in closed circuit with Screen or Air Separator. Open door accessibility. Many sizes, large or small capacities. No scrapers, plows, pushers, or shields.

WRITE FOR DETAILED LITERATURE

STURTEVANT MILL CO. BOSTON, MASS.

To the right is the ramp over which cars come from mines to dump. On the left are two 30-ft. hydroclassifiers, one being higher than the other for series or parallel operation

Nodulizing Phosphate In Kilns

Efficient phosphate recovery from lower grade matrix made possible by utilizing larger volumes of wash water, bigger settling areas, and increased flotation capacity

By **BROR NORDBERG**

PHOSPHATE washing and recovery operations in the Tennessee fields are continuing a necessary trend toward the beneficiation of lower grade matrix and more re-processing of previously worked over and discarded materials, as the higher grade materials become scarcer. Flotation and other developments in plant operation have made it practicable to rework some of these materials.

To make operations profitable, increasing tonnages of muck must be handled as the need for treating lower grade materials has become more necessary.

The Mount Pleasant, Tenn., plant of the Charleston Mining Co., Inc., Richmond, Va., has been progressively developed along these lines, and some additions have been made in recent years to make it stand out as representative of up-to-date practice in the country's second largest phosphate producing area. The company's "Arrow" washer was built in 1904, was remodeled in 1930-31, and in 1934 a flotation plant for the recovery of phosphate sands was installed.

Two phosphate nodulizing kilns looking from feed end toward firing end at recovery plant of Charleston Mining Co., Inc.

Washing down muck from storage, emulsifying it by high pressure water through the grizzley into the blade mill for scrubbing

A nodulizing plant was completed in 1938 to produce a nodulized phosphate product that is sold for use in the electric furnace method of elemental phosphorus production. Charleston is the only commercial phosphate plant operator producing nodules.

Improvements to the plant in 1939 and 1940 consisted of doubling the wash mill capacity along with greater storage capacity for raw materials and new wash mill equipment; an increase in flotation capacity and much enlarged settling areas to accommodate greater plant capacity and to handle lower grade material satisfactorily. Settling areas have been increased from a total of 12,000 sq. ft. to 23,000 sq. ft.

All of the properties being mined are classified by geologists as rim deposits. Overburdens are relatively shallow in mining the outer slopes of the hills on these properties but deepen in toward the hills to depths of 50 or 75 ft. Thickness of matrix runs from 2 to 40 ft. and in places there is little or no overburden. Mining methods have been unchanged except for the practice of working in more widely-scattered locations. Several mines are in operation simultaneously with a maximum haul of 4½ miles.

Eight draglines, of several types and capacities, are in operation for the removal of overburden and loading the matrix into 4-cu. yd. Western side-dump cars which are hauled to the washing plant by steam locomotives. The trend in this plant is toward the use of more Diesel power in the mining operations. The newest power machines are equipped with semi-Diesel engines. One is a 38A, 2-cu. yd. Marion, Hesselman-driven with crawler-tread mounting, and the second a 2-cu. yd. Harnischfeger P and H crawler-treaded machine. Others are five large Bucyrus steamers and a Lorain Diesel machine. Booms range from 40 ft. to 115 ft. in length and bucket sizes from ¾-cu. yd. to 3½-cu. yd. Trains from all the locations travel over 36-in. gauge track which converge to a common trestle leading to the wash mill bins. These are directly under the rails where the cars are dumped.

Washing, Screening and Crushing

Muck in the storage bins is delivered to the wash mill, and is thoroughly emulsified by hydraulic guns under 110 p.s.i. water pressure, which wash it down into a sump. Water is added in this process at the rate of 1500 g.p.m. A 20-in. width, 9-ft. radius scoop feeder delivers the solution into a new 8- x 25-ft. Allis-Chalmers blade mill, which is in effect a cylindrical scrubber, horizontally-mounted, that handles 125 tons of solids per hour.

After passing through the scrubber, a split is made over screens, of the fines which are to be hydrauli-

One of the 80-ft. thickeners, to the right, which receives all overflows from the other equipment, and a 30-ft. thickener to the left

Looking down onto the tops of two 30-ft. hydroclassifiers which receive minus 22-mesh material from the wash mill

cally classified from the coarser material. Out of the scrubber, the solution passes over a new 4- x 10-ft., double-deck Allis-Chalmers low head vibrating screen which has 1-in. and 3/16-in. sq. openings on the top and bottom decks, respectively. Oversize from both screen decks is carried over a 30-in. belt conveyor to storage and for further treatment, while the throughs are re-sized over a 4- x 12-ft. single-deck screen of the same make which has 22-mesh stainless steel screen cloth.

Minus 22-mesh material is pumped to hydraulic classifiers by an 8-in. Wilfley pump for further separation of the fines. Two 30-ft. Denver Equipment Co. (hydro-classifiers) overflow minus 125-mesh fines as the next step in the flow of material. These classifiers are operated either in series or in parallel depending upon the degree of clay contamination. If the clay content is high, the classifiers are run in series with a heavy rinsing between the classifiers, and then, of course, there is a sacrifice in tonnage. One tank is higher than the other, to permit gravity flow from one to the other, in series operation. Pulp density regulation, by the addition or subtraction of water, is the means of controlling the critical mesh sizes in the overflow from the classifiers.

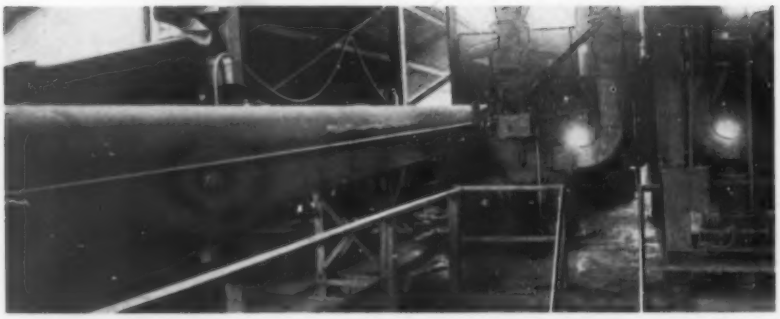
Thickened pulp is pumped by 5-in. Denver diaphragm pumps into either of two rinsing drag-type washers which dewater the product. These drags are 11- x 50 ft. and 22- x 65-ft., and were designed and built at the plant. Overflows from the hydroclassifiers are routed to either of two 80-ft. diameter thickeners, one of which is a Dorr machine and the other a new Butchart thickener. Similarly, the overs from the drags, and from all settling and classification equipment enter the thickeners.

Overflow from the thickeners is the tailings which enter large settling ponds while the underflow is put through two 30-ft. Dorr thickeners. Overflow from the small thickeners also goes to tails while the underflow is dewatered by a 32- x 85-ft. chain drag.

All the drags discharge into open wet storage piles at the end of the washing plant, which is between the drying and grinding plant and the nodulizing plant. A gantry crane is used in handling the wash mill products to any other division of the plant. Discharges from the drags are ready for sale or part become feed to the flotation plant after passage over a 4- x 10-ft. Jeffrey-Traylor electromagnetic vibrating screen. This screen has 28-mesh Tyler spring steel cloth in three panels stretched cross-wise to the screen and the throughs (125- to 30-mesh) become flotation feed. Overs return into the storage piles.

Undersize from this screen is put through a 6- x 10-ft. conditioning drum, where the reagents—caustic, oleic acid and fuel oil—are added and thoroughly mixed. The mix is then

Battery of flotation cells which process minus 30-mesh plus 125-mesh feed material



Special boring machine, to the left, for removal of rings in kilns, looking toward firing end of kilns

pumped to the flotation plant. Flotation feed contains 25 to 30 percent moisture, to which additional water is added before pumping, and contains 2-percent solids.

The flotation unit is operated under a license from the Phosphate Recovery Corp. and uses the Denver "Sub-A" froth flotation machine. Roughing cells are followed by cleaner cells and passage through air-activated cells as the finish step. Flotation capacity has been increased from the original five "Sub-A" cells to 13.

Main recent additions to the washing plant were the new scrubbing and screening equipment in the wash mill, one new 80-ft. thickener, the two 30-ft. Denver hydro-classifiers and the larger drag area. Pumping equipment comprises six Wilfley and two Georgia Iron Works pumps of 4-, 6- and 8-in. sizes. About 4500 g.p.m. of water are used in dilution and rinsing, and the tails settled in the ponds are reclaimed for re-processing in dry times of the year.

All oversize phosphatic material from the wash mill (plus 22-mesh), running up to 18- or 20-in. size which is the spacing of grate bars ahead of the blade mill, is conveyed to an 18- x 18-in. McLanahan and Stone Corp. single-roll crusher and reduced to 3-in. top size. Much of this material is utilized for kiln feed in the nodulizing plant, but some of it is to be ground for flotation feed to increase the output of that department.

A ground material is considered better flotation feed and capable of better recovery than natural sands since the fresh surfaces adhere better to the flotation reagents. This grinding is to be accomplished by a 6- x 8-ft. Kennedy ball mill which will be operated in circuit with vibrating screens.

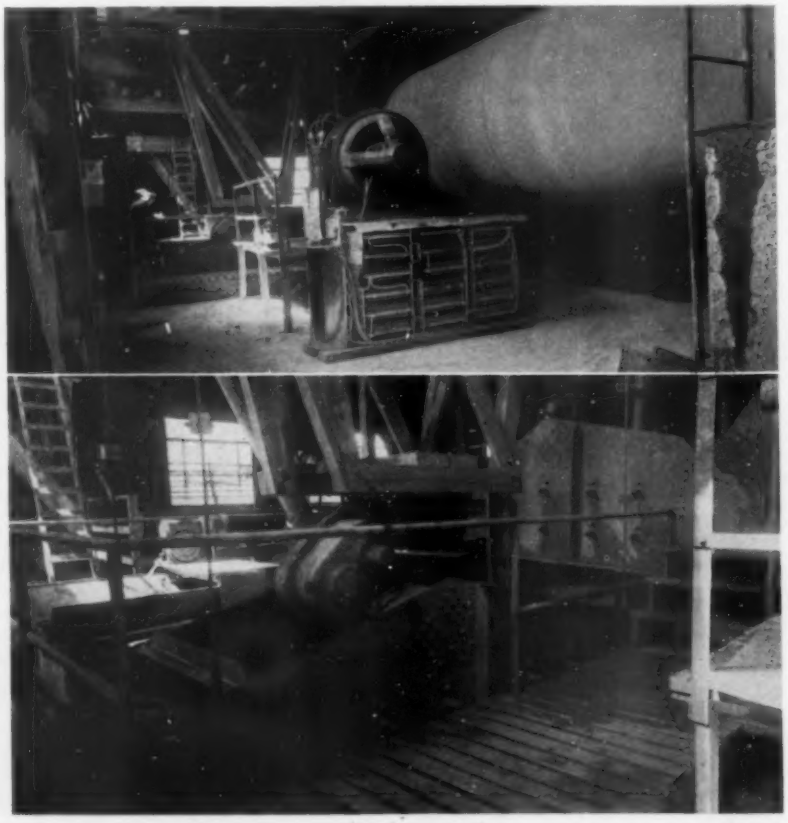
There will be two screens, a 2-deck 3- x 8-ft. Allis-Chalmers Low Head, and a 4- x 8-ft. single-deck Allis-Chalmers Ripl-flo screen. One screen is to have $\frac{3}{8}$-in. openings on the top deck and $\frac{1}{8}$- or 3/16-in. openings on the bottom deck and the other will have 30-mesh screen cloth. Differential grinding through the mill with regular analyses of the material stream will determine when the screen oversizes should return to the mill or be rejected as tails. If the silica (flint) content in the oversizes increases to a proportion of 6:1 part phosphate the material would be thrown away since its analysis is inferior to that of the flotation tails. At times the oversizes from both screen decks of the first screen would go to tails. Undersize from the 30-mesh screen cloth becomes flotation feed and the overflow will return into the ball mill.

Rock phosphate to be ground for fertilizer is conveyed from the wash mill storage and first put through four 5- x 50-ft. rotary dryers. Grinding is done by two 5-roll high-side Raymond mills and a 5- x 10-ft. ball mill in closed-circuit with a 12-ft. Raymond mechanical air separator. Ground rock is shipped in bulk by rail or truck and some is sacked by a Bates 4-spout bagging machine. This part of the plant has been changed very little in recent years.

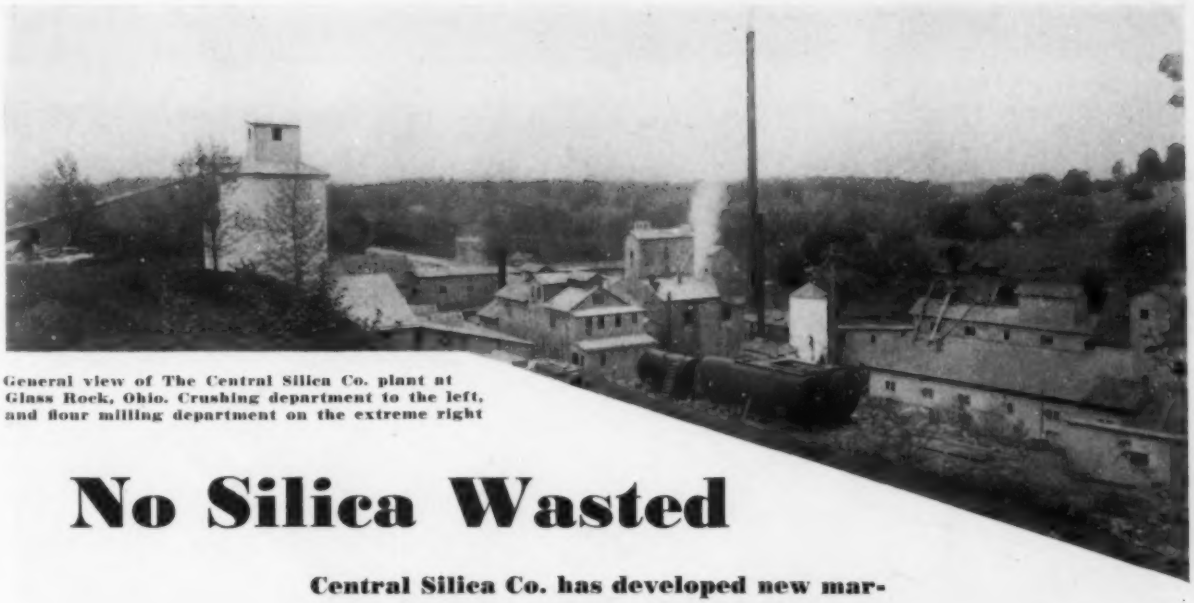
Nodulizing Plant

Nodulized phosphate has become an important product at this plant and the process consists of the passage of phosphatic materials through rotary kilns at such temperature as to roll the materials into shapes suitable for reduction to elemental phosphorus in the electric furnace. The reduction process, in electric furnaces, requires that the phosphatic materials be in the form of an agglomeration without extreme fines which would retard the process. The only other requirement, besides size

(Continued on page 46)



Above: Looking toward discharge end of blade mill where screens separate at 22-mesh for hydro-classification. A 9-ft. radius scoop feeds muck and water into this mill. Below: Two vibrating screens in new wash mill which make separation at 22-mesh, sending minus 22-mesh to hydroclassifiers



General view of The Central Silica Co. plant at Glass Rock, Ohio. Crushing department to the left, and flour milling department on the extreme right

No Silica Wasted

Central Silica Co. has developed new market outlets for numerous silica products obtained by improved recovery methods

HIGHER QUALITY requirements and an ever-increasing number of markets for industrial sands are trends which are constantly being met by The Central Silica Co. through improvements at its Glass Rock, Ohio, plant.

Back in 1900, molding sand was the only product. In 1925 a start was made on acid leaching of sands for the removal of iron minerals and, since perfection of the process, sand for the manufacture of high quality glass, and flint for the pottery trade, have been the principal products. Today a large proportion of the plant output goes to glass factories which specialize in manufacturing only the highest quality glass. The remainder is divided into pottery flint, molding sands and ground silica flour, which has a variety of uses.

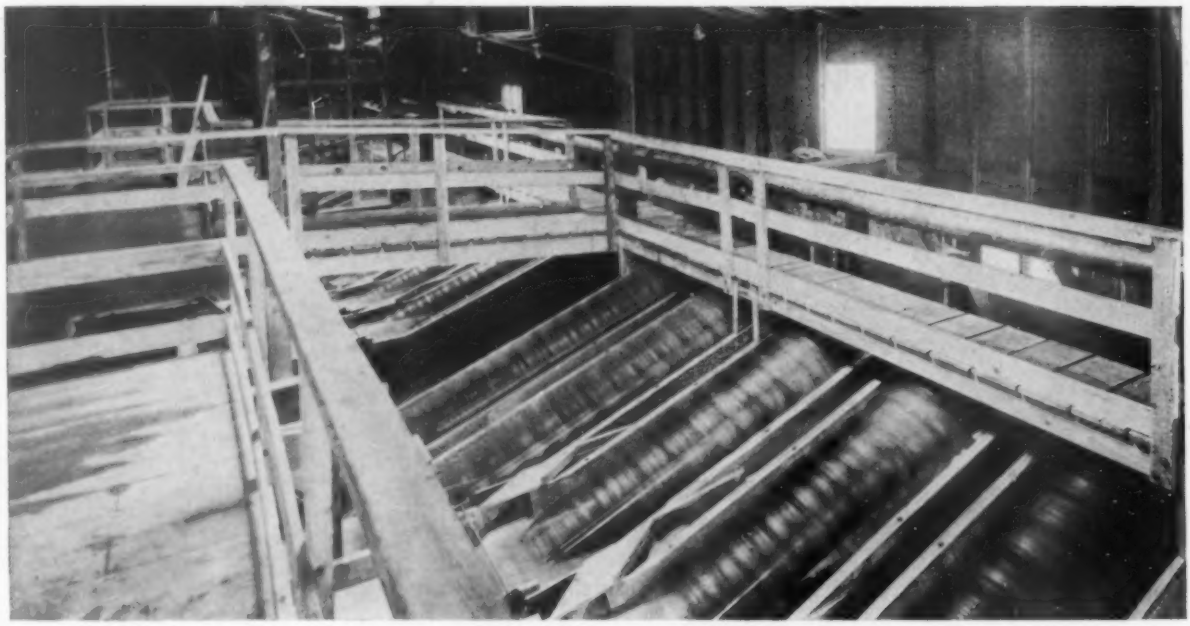
Plant capacity has been steadily increased, and a number of installations have been made to improve quality and to increase efficiency. Daily capacity is about 1100 tons of glass sand, foundry sand, silica flour and pottery flint. About 1500 tons is the daily capacity of rough product put into bins and available for processing. Sands are produced from three quarries near the plant.

A 1936 development was installation of a 24- x 36-in. Traylor type H jaw crusher which operates as a primary breaker ahead of the wash mill. A 1940 development has been the erection of four Marietta concrete stave silos for storage of various products (coal, partly processed and finished sand products) and to provide important reserves of sand between various stages of manufacture to keep the mill supplied in the event of breakdowns. At the same time the wash mill capacity has been doubled, and two steam dryers and boiler equipment placed into operation to replace a gas-fired rotary dryer. Aside from these recent mill developments, other units to better refine the product have been introduced including more efficient auxiliary devices such as new-type mill feeders, rubber-lined piping, etc. Control devices have been added at many locations to regulate and improve production. The plant is now completely electrified through gradual replacement of engine drives.

Battery of concentrator tables which remove free iron from glass sand

At the glass sand quarries the sand occurs as a rock consisting of 99.9+ percent silica grains cemented together with loam, clay and other soluble impurities. The formation is known as Pottsville Conglomerate and occurs over a limited area geographically. Grain sizes are generally larger than those taken from the other quarries, averaging around 50-mesh. This is a more ideal material from which to produce glass sands that range according to specifications, from 30-mesh to 100-mesh approximately.

As milled, the sand contains .05 percent Fe_2O_3 which must be reduced to below .015 percent to meet requirements for the manufacture of the finer, uncolored glasses. This requirement has stiffened a great deal in recent years. The iron oxide occurs as a surface coating on the individual grains, or in granular form but not within the grains of silica, and is removed by a combination of washing and scrubbing, tabling and acid leaching until the finished sand contains only about .01 percent.



Spiral washers which wash out clay and other solubles from glass sand. The spirals are in series in groups of five

Most of the sand is taken from the Glenford deposit, which is being worked on a 46-ft. face in the conventional open quarry pattern. Drilling is done wet by wagon drills which sink 2¾-in. diameter holes the full height of the quarry, with the holes spaced on 7-ft centers. The primary blast is followed by pop shooting and loading into trucks is done by a 1¾-cu. yd. Koehring gasoline shovel. Hauling to the plant is on contract with an average load of seven tons.

Crushing, Washing, Milling and Screening Operations

After passage through the jaw crusher, to break the rock to 3-in. top size as the ideal feed into the washing plant, a 30-in., 100-t.p.h. belt conveyor places the rock into either of two storage silos. One of the stave silos, having a capacity of 500 tons, was built in 1940 to serve the newly built washing plant addition. With the other silo, a capacity of 700 tons is available, which is enough to keep the mill supplied for a full day's run.

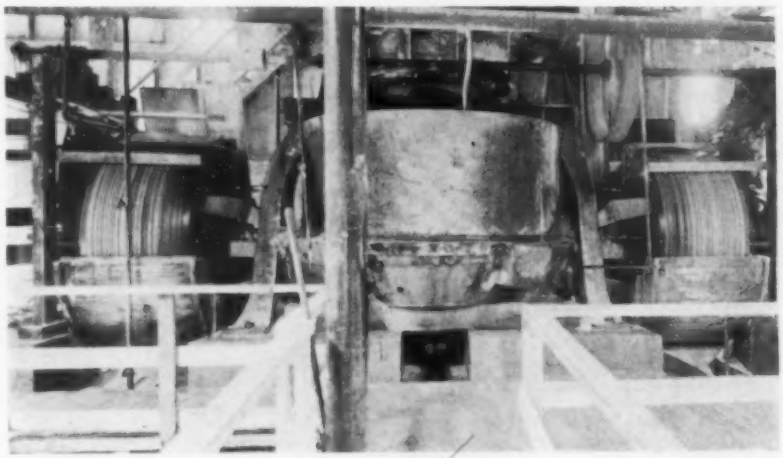
Each silo feeds out directly into a washing unit, which in each case consists of a Lewistown wet pan and revolving screens followed by disc washers. Each unit is independent of the other.

Wet pans serve to grind the rock into its grain sizes without the destruction of individual grains through excessive grinding, importance being placed on a control over the feed. The new washing unit has a Jeffrey-Traylor vibrating feeder to regulate the flow of rock direct from the silo into the wet pan. Its operation is governed by the loading in the pan to maintain a bed of material about 4-in. thick. On the other mill, an apron feeder adjusts the rate of feed automatically.

Each wet mill has hardened punched plate bottoms with ⅞-in. holes, and the 30-in. diameter crushing tires turn at 15 r.p.m. The discharge from each pan is split into two revolving screens which have 10-mesh wire. It is desired that all material pass 10-mesh and that as much as possible be retained on 100-mesh. As the revolving screens do their screening only on the bottom side, each screen has internal lifters to raise the rejects and drop them on to a tray, or steel flume, inside the screen which, with the help of a water spray, feeds the rejects back into the pan by gravity.

All the minus 10-mesh sand from each screen enters into a set of spiral disc washers. In one half of the mill each set consists of four Lewistown disc washers in series, each turning in a separate settling box. The other unit consists of two sets of five Jeffrey disc washers similarly operated in series.

All the "wormers" wash, scrub, classify and dewater for transference of the washed sand by belt conveyor to the next production step. Their efficiency as classifiers controls the ultimate gradation of the finished sand. It is desired to remove enough



One of the wet pans (center) with a revolving screen on each side which are closed-circuited to reduce all material to 10-mesh. Note flume coming from interior of each screen to return rejects

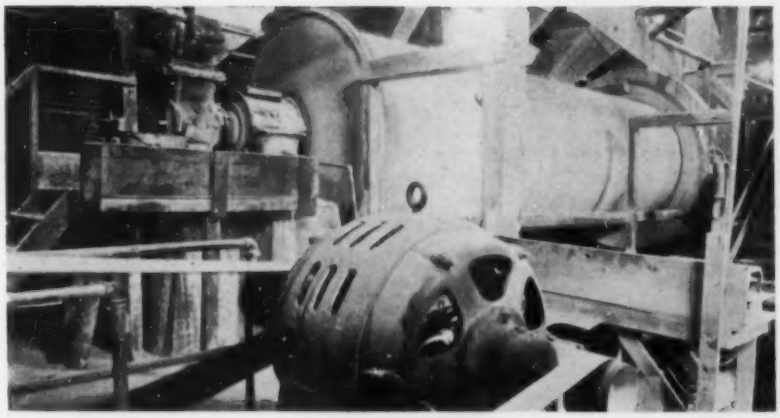
fines to produce a sand having a very high percent retained on 100-mesh and to have sufficient settling area to control the bottom side of the gradation.

Overflow from the box enters a drainage sewer, and at the head of the drainboard the dewatered sand enters a launder feeding a 16-ft. washer. The process repeats itself in each case and the fourth washer discharges on to a belt conveyor. The same procedure takes place in two units for each mill, giving four points of discharge of dewatered sand, and overflows from all washers go into a common sewer.

By washing in series, all the sand is subjected to intensive scrubbing action, and the overflow carries away the undesirable solubles, including loam, clay and some Fe_2O_3. Some fines are sacrificed to get rid of these materials. Overflows which enter a settling sump are dipped out by a crane. This product is sold for use as a source of silica in the manufacture of portland cement and as a material to be blended with commercial production to make up a deficiency in fines in concrete sand, molding sand and core sands.

About 1800 g.p.m. of water are used in the wash mills, the major portion entering into the wet pans and some into the washers and revolving screens. About 1600 tons of rock can be handled through the washing process in 24 hr., which conforms to a quarry output of 16 hours. All the spirals have renewable wearing plates of soft steel which are bolted to the main discs.

Sand from the other two quarries is handled through the same treatment and stocked in open storage to be carried on to the molding sand division of the plant. Glenford sand is taken by the belt conveyor from the washing plant either direct to concentrating tables, or a knife-edge diverts the stream on the belt to another conveyor which stocks the sand for later tabling treatment. This sand is conveyed from stockpile by crane and slackline to a bucket elevator.



Tube mill for production of silica flour in closed circuit with air separator

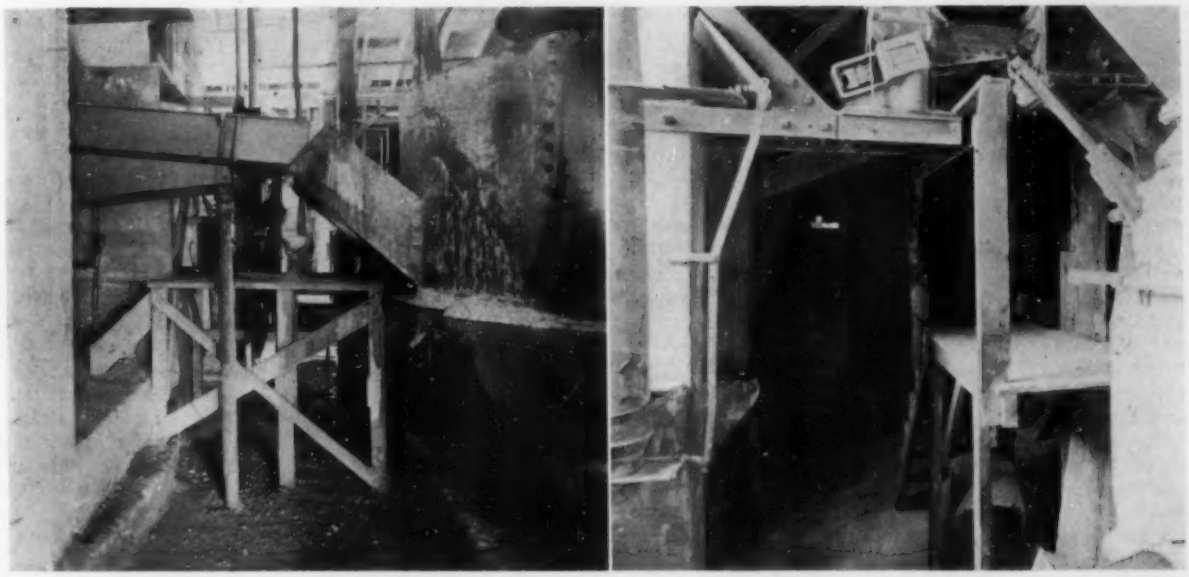
Removing Free Iron By Tabling

Free iron minerals are removed by passage of sand over Deister Machine Co. concentrating tables which sort out the free iron minerals previously loosened by scrubbing in the wash mill. The tables reduce the iron content of the sand to about .040 percent at the rate of 25 tons per hour.

Tabled sands are drained to about six percent moisture and are then reclaimed by an inclined tunnel belt conveyor into either of two new steam dryers which drive out the moisture and discharge dried sand at the rate of 25 to 30 tons per hour each. Steam at 200 p.s.i., which circulates through wrought iron pipe in the dryer and drives out the moisture by radiation, is developed by a new 250-hp., stoker-fired B & W type H boiler designed to produce 2200 lb. of steam per hour. Condensate is pumped back into the boiler water tank from a receiver under pressure at 360 deg. F.

Boiler operation is entirely automatic and instrumentalized. Two-inch minus run-of-mine coal is fed into the firebox direct from a new Marietta silo which fills a Combustion Engineering stoker.

Each steam dryer discharges below to an 18-ft. steel vibrating trough



Left: Vibrating feeder used to feed material into wet pan. Operation is automatic, the rate of feed varying with load in wet pan. Right: Electric feeder for ball mill grinding flour. Operation is controlled by an "electric ear"

feeder which has four Jeffrey-Traylor vibrating units. These in turn transfer to a similar conveyor which handles the dried sand to the acid leach plant where the Fe_2O_3 is reduced to .01 percent.

Acid is applied in a rotary mixer from which the sand is elevated and piped into cylindrical tubs. Any water needed is added in the tubs through submerged spray lines. After leaching, the acid is washed off, the dissolved iron content is removed by water, and the water is neutralized by a lime treatment before wasting it into a nearby stream. This acid treatment process is fully covered by patents.

Washed sand is then conveyed by belt conveyor into a drain bin of 30 carloads capacity. As needed, the sand from this bin is drawn out to a tunnel belt conveyor and dried to about 140 deg. F. through a third steam coil dryer which feeds to a belt-elevator system of conveying to the finish screens.

Sizing is done over Deister "Multirap" mechanical single-deck vibrating screens which have two sections of 18-mesh wire cloth followed by a third section with 20-mesh openings to produce the desired grading of glass sand. Throughs are the finished high grade product which has an approximate analysis of 40 percent on 50 mesh, 70 percent on 70 mesh and 96 percent retained on the 100, with 100 percent passing 20-mesh. This product is conveyed into two new Marietta silos of 10 carload capacity each ready for shipment by rail. Stephens-Adamson portable box-car loaders are used to fill the cars.

Make Silica Flour By Two Methods

Screenings retained on the top deck (10-mesh to 18-mesh) are marketed as sand blast sand and for other uses or are the feed for the silica flour plant. Flour is produced by two methods, each of which manufactures a product particularly fitted for special markets.

One method is by grinding through an 8- x 14-ft. Hardinge air-swept mill. This mill is fed by a No. 2A Jeffrey - Traylor vibrating feeder which is regulated by a Hardinge "electric ear," utilizing sound within the mill to maintain the optimum feed into it.

The second mill is an 8- x 22-ft. straight Lewistown tube mill fed by belt conveyor, which is in closed circuit with a 12-ft. Sturtevant rubber-lined air separator. Both mills are lined with 4- x 4- x 8-in. flint block and utilize Danish pebbles for grinding.

Coarser grades of flour, around 140-mesh, are produced by the air-swept mill, and the 200-mesh finenesses are made in the tube mill. The Hardinge mill product is marketed for various foundry uses and the other is used extensively in pottery manufacture where more diversification in particle sizes is desired.

Fine Dust Recovered

All sizing screens for dry screening and points where dust is created in the grinding mill are exhausted to two Sly bag-type dust collectors. About 80 percent of the flour is shipped in bulk in cars, loading through galvanized iron tubes. When loading cars, a duct connected to the collector is extended into the car to draw off dust. The dust, which is of about 400-mesh fineness, is sold for the manufacture of soaps and scouring powders. This product, and some of the flour, are packed in paper bags by a Bates valve bagging machine.

Another part of the plant, set aside for the manufacture of molding sands for steel castings, etc., consists of a gas-fired rotary dryer and a Deister "Multirap" single-deck screen identical to those used for glass sand sizing.

The washed sands are placed into the bin at the head of the dryer by a crane and, after removal of moisture, are sized over 18-mesh screen cloth. Oversize sand is sold for sand blast sand, for cement manufacture or other uses. Minus 18-mesh sand is used for steel foundry castings and has the same approximate sieve analysis as the glass sand. This sand must be cooled down from 140 deg. F. to 90 deg. F. to meet requirements in making cores. This is accomplished in a rotary cooler.

Water for the plant is pumped from a nearby creek by two pumps and supplemented by a deep well pump, the three filling a reservoir at the rate of 2400 g p.m. From the reservoir, four additional pumps handle the water into the plant, with clarified water returning into the reservoir.

E. M. Ayers is president of The Central Silica Co.; Russell G. Hay, vice-president and sales manager; and Charles Runkle, secretary. M. E. Croskey is superintendent.

The Use of Lime In Sewage Treatment

"PRINCIPLES OF SEWAGE TREATMENT," by Dr. Willem Rudolfs, Rutgers University, is the title of Bulletin 212, recently published under the auspices of the National Lime Association. The booklet has been prepared for those who wish to know something more about the composition of sewage and the principles of its treatment while they are engaged directly or indirectly in this work, but who may lack the time or training necessary to become experts. Copies may be obtained from the National Lime Association, Washington, D. C., for 50 cents each.

Asbestos in Demand

THE WAR thus far, has not retarded importations of asbestos into the United States. In fact shipments from South Africa are at peak. Even shipments from Australia are reaching these shores with regularity. Exports to Japan are restricted. Importation of asbestos from Canada is constantly moving upward due to the use of asbestos in the national defense program.

Textiles. There is not much change in the asbestos textile situation, nor has there been for the past two or three months. On some types of asbestos textiles the Industry is oversold. The demands of the U. S. Navy for high grade cloth continues to be very strong, and the requirements of the Navy for asbestos packings are taking a large quantity of asbestos yarns. Increasingly large quantites of asbestos yarn are being used in connection with friction materials for use in defense equipment.

The selling price trend on asbestos textiles is upward.

Brake Lining. March sales of brake lining were considerably higher than those for the same month last year with every sales field recording increases. When compared with February 1941, the current month's sales were higher despite slightly lower volumes for two classifications.

Paper. Demand is seasonable in this commodity, although it has slackened slightly since last month.

Millboard. The volume continues to be very large—for shipwork, army camps and other defense activities.

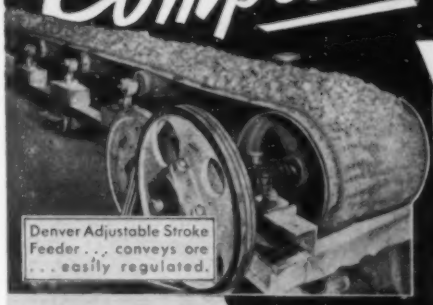
Insulation. High Pressure. Demand continues strong. Volume of shipments continues to increase as work progresses on the multitude of defense projects.

Insulation. Low Pressure. Not so much volume showing in this market, but prices appear to have stiffened somewhat.

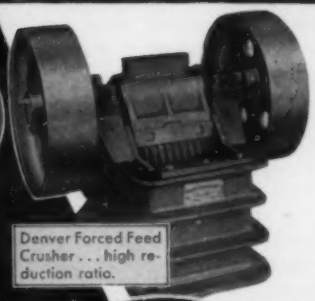
Asbestos-Cement Products. Conditions in the asbestos cement industry remain practically the same with a substantial backlog of unfilled orders on hand in all lines and with signs of increasing delay in shipments of industrial products such as corrugated and flat sheets, for which the demand is exceptionally large in connection with national defense construction work.

Asbestos—May 1941

Complete MILL EQUIPMENT *from* CRUSHER *to* FILTER



Denver Adjustable Stroke Feeder . . . conveys ore . . . easily regulated.

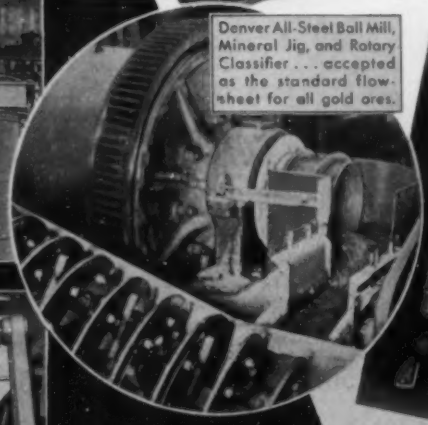


Denver Forced Feed Crusher . . . high reduction ratio.

Denver Equipment Company manufactures a complete line of machinery . . . from "Crusher to Filter." By placing the responsibility of your equipment with this company:

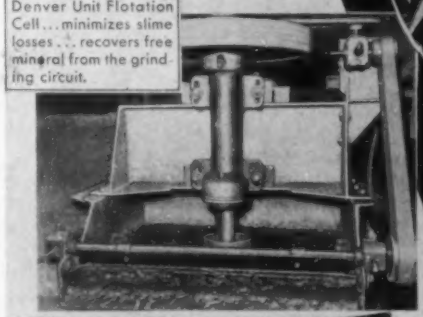
1. You save time . . . prompt delivery.
2. You save money, "Standardization + Quantity Production = Lowest Cost.
3. You are assured of trouble-free operation, due to properly coordinated and balanced units which are correctly designed to give you continuous "24 hour service."

Denver Conditioner . . . no short circuiting . . . controlled agitation. Denver Bolted Steel Tank . . . inexpensive . . . easily assembled.



Denver All-Steel Ball Mill, Mineral Jig, and Rotary Classifier . . . accepted as the standard flowsheet for all gold ores.

Denver Vertical Sand Pump . . . gravity feed flow simplifies handling of froth, slime-free sands, or any troublesome pulp.



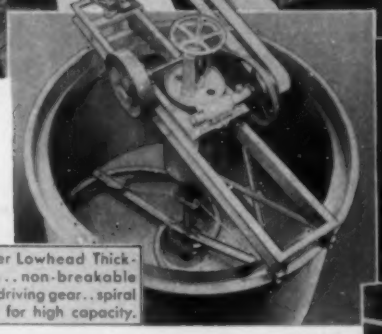
Denver Unit Flotation Cell . . . minimizes slime losses . . . recovers free mineral from the grinding circuit.

Denver Sub-A (Fahrenwald) Flotation machine . . . efficient . . . flexible . . . foolproof . . . standard the world over.

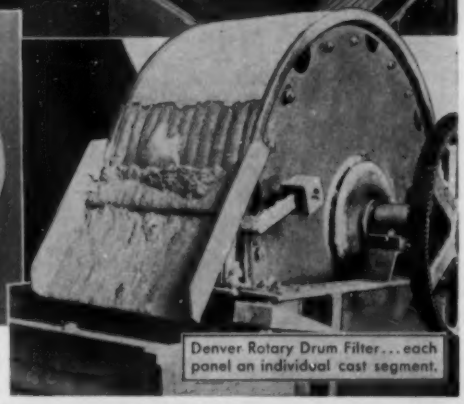
Denver-Wilfley Concentrating Table . . . for pilot work or gravity concentration.

Denver Wet Reagent Feeders . . . accurate . . . easily regulated . . . low in cost.

Denver Diaphragm Pump . . . a type for every problem.



Denver Lowhead Thickener . . . non-breakable steel driving gear . . spiral rakes for high capacity.



Denver Rotary Drum Filter . . . each panel an individual cast segment.

ABOVE: Two Denver Hydro-Classifiers operating at Charleston Mining Company; Denver Adjustable Stroke Diaphragm Pumps and Denver "Sub-A" Flotation Cells are also used at this plant. Have you a copy of our new Flotation Bulletin No. F-11-B?

USE OUR BATCH AND CONTINUOUS ORE TESTING FACILITIES

DENVER EQUIPMENT 24 HOUR SERVICE COMPANY

NEW YORK CITY, NEW YORK: 50 Church Street
CHICAGO: Suite 1005, 69 W. Washington Street
SALT LAKE CITY, UTAH: 727 McIntyre Building
TORONTO, ONTARIO: 45 Richmond Street West
MIDDLESEX, ENG.: 493A, Northolt Road, S. Harrow
MEXICO, D.F.: Baker Bldg., 16 de Septiembre 58
SANTIAGO, CHILE — LIMA, PERU
JOHANNESBURG, SO. AFRICA: 8 Village Road

STANDARD RELIABLE 24 HOUR SERVICE EFFICIENT

DENVER EQUIPMENT COMPANY, 1400 17th St., Denver, Colorado

Nodulizing Phosphate

(Continued from page 40)

of particles, is for a guaranteed lime: silica ratio which will make the nodules self-fluxing in the electric furnace. It is also required to restrict the alumina to a low figure.

Thus it is desirable to use some high silica material and the process permits the use of low grade materials, as long as the other requisites are realized.

The nodulizing plant consists of two 8- x 125-ft. coal-fired, rotary kilns, formerly used to make cement, and crushing and sizing equipment. These kilns are fed washed material from feeder bins by auger-type feeders which positively control the rate of feed into the kilns through water-cooled chutes. Feed material consists of various washed fines, and lump material up to 4-in. size, all blended together with the flotation product in desired proportions by the gantry crane by placing into the feed hoppers. Laboratory analyses of the several blended materials are the means of arriving at the proper proportions.

Feed of the mix into the kilns, running 30 percent moisture, is controlled from the burner floor through Link-Belt PIV variable speed drives on the auger feeders. Nodulizing, or the formation of a sintered material, takes place at a hot zone temperature of 2350 deg. F. with a mix of the average low alumina content. At this temperature, chunks as large as 4-ft. size are formed in passage through the kilns, each of which discharges into a 5½- x 45-ft. rotary cooler.

These coolers both discharge on to a common 30-in. heavy duty Link-Belt cross pan conveyor which carries the hot product to an 18- x 30-in. McLanahan and Stone roll crusher. After crushing, the product is sized over a 4- x 6-ft. Jeffrey-Traylor electric vibrating screen having a top deck with 2½-in. openings and a bottom deck of 6-mesh. Minus 6-mesh is returned into the kiln feed material, plus 2½-in. returns to the crusher and the plus 6-mesh minus 2½-in. material is loaded directly into gondola cars or placed in storage as the finished product.

Each kiln is driven by a 30-hp. motor with a Link-Belt gear-chain drive, and has a speed range of 0.85 to 1.7 r.p.m. If the product has a brownish color it is underburned and the kiln speed is reduced by the burner. Each kiln is lined with 70 ft. of 45 percent alumina brick in the hot end followed by Alabama clay brick for the rest of its length.

Each kiln is fired by a Raymond bowl mill, utilizing a 11,800 B.t.u. western Kentucky coal. Coal is first put through a rotary dryer to remove surface moisture and then fed to the bowl mills. Primary air is taken from the kiln hoods and is introduced into the burner at 180 or 190 deg. F. and the secondary air is held to about 400 deg. F., producing a short controlled flame.

Passage of wet muck through the rotary kilns and the crushing and handling of hot nodular materials brought up operating difficulties which have had to be eliminated in the plant. The material has a decided tendency to form kiln rings, which build up much faster than rings in rotary lime and cement kilns. Rings form up to within 4 ft. of the discharge end of the kiln and extend back a distance of 30 ft. into the kiln. In a matter of a few hours the kiln would fill up in this area, if a device had not been perfected to clear out the kiln at regular intervals.

Each kiln has been equipped with a boring bar 30 ft. in length that has a cutting edge to dislodge the ring while the kiln is in operation. Each bar is horizontal and is driven by a variable speed motor and gears, and in operation, the bar travels into the end of the kiln to literally ream out the scale. Inward speed of travel can be varied from zero up to 30-in. per minute and the bar is withdrawn at the rate of 60 in. per minute. The process is repeated every two hours. A clearance of 2 or 2½ in. is allowed between the kiln lining and the bar cutter to allow for irregularities in the kiln shell and to leave a protective layer of scale over the lining.

Ring removal must be done while the scale is hot and therefore the cutting edge is subjected to high temperature. The cutting edge is of ⅝-in. plain steel faced with cast iron, of hollowed fabrication, and with a continuous stream of cooling water pumped over its inner side. In operation, the edge is directed into the direction of rotation of the kiln and the kiln burner pipe is directed toward the lead side, extending 4 ft. inside the kiln.

Crushing and screening are complicated, because of the heat of the mass when discharged from the kilns. When conveyed to the crusher, the material is still red hot and often at a white heat, with a temperature of 800 to 1200 deg. F. The crusher has a steel frame, has bronze bearings and a capacity five times the required production. An electro-magnetic vibrating screen avoids the use of bearings and the coils have glass insulation. Screen cloth is a manganese steel wire-mesh.

Most of the construction and fabrication in this broad building program was done by company employes. W. S. Stringham is works manager; R. J. Grissom, superintendent; and M. J. Lacy, chief engineer and master mechanic.

Canadian Magnesitic Dolomite

INTEREST HAS REVIVED in a deposit of magnesitic dolomite that was discovered in Kilmar, Grenville Township, Argenteuil County, Quebec Province, in 1900 and exploited from 1914 to 1918, when Austrian supplies were difficult to obtain. Production increased from 358 tons in 1914 to 52,434 tons in 1918. The Quebec deposit contains a great deal of lime that at first was believed to be impure for refractory purposes. However, recent scientific discoveries have revealed that the lime content is valuable instead of a drawback.

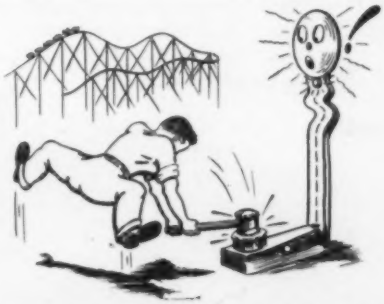
It is reported that experiments carried on coöperatively by the National Research Council and certain Canadian firms have resulted in the conversion of the lime content into a new necessary chemical, which gives furnace linings longer life as well as being easier to apply. It is said that large supplies have already been shipped to Great Britain. As far as could be ascertained, at least 30 new refractory products have been created from this particular type of magnesitic dolomite.

Canada Gypsum Production Is Booming

GYPSUM PRODUCTION in Canada set an all-time record in 1940, when the output amounted to 1,448,788 tons valued at $2,065,933, compared with 1,421,934 tons valued at $1,935,127 in 1939, the previous record year. Canada probably ranked third among the world's gypsum producers in 1940, reports the Department of Mines and Resources, Dominion of Canada. Nova Scotia is the largest producer, followed by Ontario, New Brunswick, Manitoba and British Columbia.

Fullers' Earth

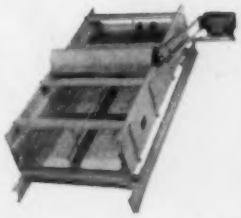
A FULLERS' EARTH deposit is being developed four miles southeast of Vici, Okla., on a small scale, preparatory to the installation of a modern plant. It is presumed that most of the production will be used in mudding oil wells.



IT LOOKS EASY! . . . BUT TRY IT

The way UNIVERSAL VIBRATORS screen dry, damp, wet or sticky materials makes the job they do look easy too! That's the Universal way of screening. At the same time—they provide economical, trouble-free service.

This is what one of our customers had to say about the Universal Vibrator he uses: "Your machine has been used continuously for the past two years, and without any bill for repairs whatever."



UNIVERSAL VIBRATING SCREEN CO.
RACINE ~ ~ WISCONSIN

Write today for complete details about UNIVERSAL VIBRATORS.

When Time is the Factor

Trade DEMPSTER DUMPSTER Mark Reg. No. 383486

is the Answer

Loaded containers ready for pick-up

All out at the dump! The quick, easy way

The Army . . . the Navy . . . and the Air Corps are calling on every source of supply to "Speed-it-up."

They are using DEMPSTER-DUMPSTERS in their operations. Many of their "Feeders," including the Steel Mills, Crushed Stone Plants, Aluminum Manufacturers, Lime Quarries and Cement Plants, have standardized on the BUCKETRUX to assist in the big push to get maximum efficiency in the production line.

The standard DEMPSTER-DUMPSTER handles all types of Detachable Containers, and the Units are built to service Buckets carrying net payloads from 6,000-lbs. to 12,000-lbs.

Catch up with progress — Use DEMPSTER-DUMPSTERS.

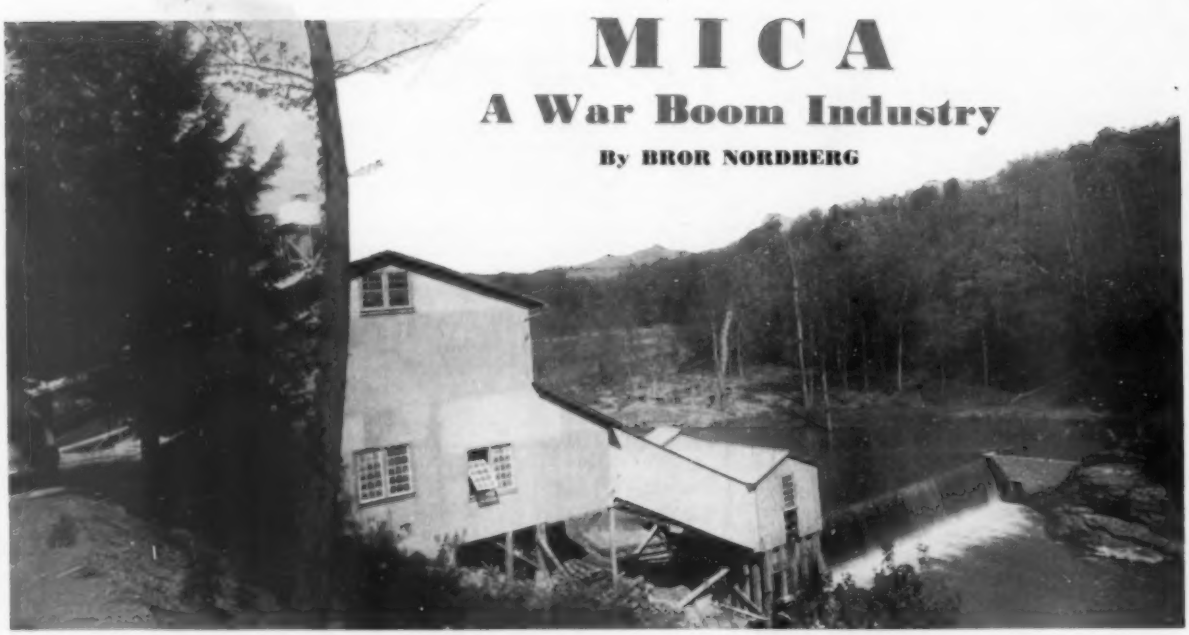
Call or wire for information.

DEMPSTER BROTHERS, Inc. KNOXVILLE, TENNESSEE U. S. A.

MICA

A War Boom Industry

By BROR NORDBERG



Water power drives all equipment in the processing plant of Diamond Mica Co., Spruce Pine, N. C.

MICA production in the Spruce Pine area of western North Carolina, the mica producing industry center in this country, has been considerably affected by the war in Europe and also by the increased industrial activity in this country. Shutting off imports of sheet mica from abroad has sharpened the activities of prospectors and miners in their search for larger and more perfect sheets of mica to take the place of imported materials.

As a result, many old mica mines have been re-opened in the mountains around Spruce Pine and there are some new ones being worked to get out sheet mica for the plants which fabricate and punch the plates into a myriad of shapes and designs for many purposes. Many of the mines are short-lived, but as long as there continues a demand for high grade sheet, prospectors will be active and new deposits discovered and opened.

Mica is a lustrous, laminated, hard silicate of aluminum and magnesium, characterized by cleavage in one direction, that possesses high electrical resistance and will not fracture with temperature changes. These characteristics are desirable for insulation by the electrical and insulation industries, which are particularly active in these times. Large size plates of mica, used by these manufacturers, are extracted by hand separation and sold by the miners to plants for fabrication.

Spruce Pine has four plants which

Sheet mica is on the list of strategic minerals, but the biggest volume of production is in ground mica

cut, shape and punch the sheets into washers, spark plug insulators, electric toaster insulation and into other shapes for different purposes too numerous to mention. These plants have been well-equipped with power machines to turn out finished mica sheet products on a large scale. Trimmings are largely sold to mica grinding plants.

While sheet mica has boomed because imports have been shut off, the output of sheet actually is only 10 to 15 percent of the mica production in the area and that part of the mica industry is therefore relatively unimportant.

However, Spruce Pine also has well-established and well-equipped mica-grinding plants, in which mica is ground and screened for sale to various other consuming industries. These companies are all in active operation because of our high industrial activity, although there has been a drop-off in some lines of products which were formerly exported to foreign countries. Generally speaking, these old-line companies are still following methods of production used in the area for years, with some variations in particular instances. Some new products and markets have been developed.

Dry ground mica is pulverized, generally, by hammer mill or attrition mill grinding and is sized over vibrating screens. Sized dry ground mica is used principally in the manufacture of prepared asphalt roofing by dusting on the hot asphalt coating to prevent sticking in the roofing roll or shingle bundle.

Water ground mica, such as is ground by the English Mica Co., is made by a process of batch grinding in tubs with large wooden wheels rolling over wet mica — somewhat similar to an ordinary wet pan operation. The finished product is reclaimed by water classification, with the foreign and abrasive content removed by the process of differential settling. In this process the mica flakes are polished, which is said to increase the luster and lubricating qualities.

Water ground mica is used by automobile tire manufacturers as a mineral lubricant and by wall paper manufacturing firms for a lustrous finish on wall papers. English Mica Co. is the only concern in the area producing biotite mica, also water ground, which is used in the manufacture of rubber products; in aluminum paints, for decorative effect in stone cast to simulate granite and for other purposes.

These micas, for grinding by either process, are mined by the grinding concerns or these companies purchase micas that are already processed by other concerns and separated from other minerals. Scrap

mica from punching plants also is used. Ordinarily, micas mined for grinding occur with clay, quartz, feldspar and other impurities.

Dry Grinding at the Victor Mica Plant

It is common practice, at the mines, to hydraulically mine the matrix and put the mixture of solids through crushers to release the mica and then through screens, followed by settling of the undesirable minerals from the mica. A typical classifying plant is one operated by the Victor Mica Co., Inc., of Spruce Pine, which operates dry grinding plants. A recent development of this company is the installation of drying and screening equipment at one of its mines, in preference to transporting wet material to the finishing plant, a distance of about six miles.

Briefly, matrix and water are elevated and flumed into a rotary screen. The matrix contains about 15 percent muscovite mica, 20 percent silica and the rest is clay. Plus ¾-in. material is rejected to waste since practically all mica contained would pass through that screen opening. Minus ⅛-in. material is flumed to a Hartz jig and ⅛- to ¾-in. material is crushed through rolls and re-screened in a revolving screen. The fines from this screen are laundered to the jig, etc. Some mica is taken directly from the screens, as the reduction becomes fine enough, and the balance is recovered by the hydraulic jig. In the jig, the flatness of the mica allows it to be retained on submerged screens, when vertical water currents are introduced from below, while the sands settle.

Moisture is removed through a rotary dryer and the dried material is screened over vibrating screens, where a suction fan pulls the fine mica from off the screens, while the sands fall through, thereby effecting a further separation. This process follows the general plan of recovery in other plants, in theory, although different apparatus is used by some for differential separation of mica from the sands.

The Victor Mica Co. re-processes this mica at its principal plant to further separate mica from residual sand and does it by air tabling. This concern is the only one employing this method, which has been perfected in the last five years to do a very effective job.

Mica, as delivered in a dry condition from the mines, is first screened over a Day Ro-Ball sifter No. 82 which is a 40-in. by 10-ft. double-deck enclosed screen. No sand is contained in the plus 8-mesh material from this screen. A separation is made of the finer material into 14-mesh to 8-mesh size which comprises the feed to one air table and minus 14-mesh which is processed over a second air table.

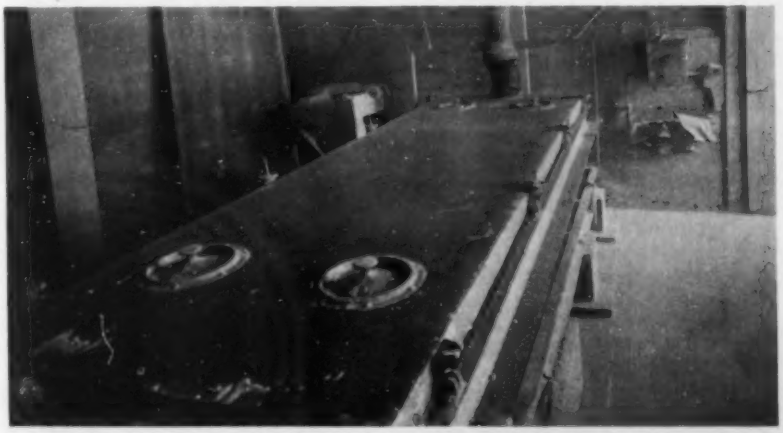
These tables were manufactured by Sutton, Steele and Steele, Inc., Dallas, Texas, and look very much like the ordinary wet concentrating table. The difference is that a uniform blast of air is applied from below through gaberdine cloth by a fan to separate mica from sand, instead of using water and the motion of the table employed in the ordinary agglomeration wet process.

Specific gravities of the mica and sand do not differ much, but the shape of the mica and its tendency to "float" permits the separation by controlled volumes of air. Sand is caught in riffles similar to those used in wet tabling and the mica comes off the table as a finished product ready for grinding. Evidently, an advantage in this method is the fact that mica and sand do not stick together, because the feed material is substantially "bone" dry.

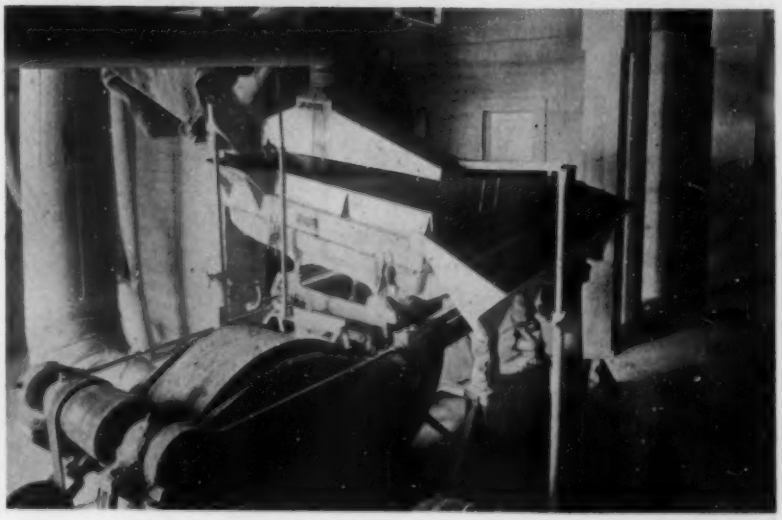
An adjustable damper from the fan on each table is the means of controlling the separation. Larger volumes of air are needed on the table which is fed coarser material. Production is about 24 tons a day. This concern also mines a lower grade mica schist which is pulverized by hammer mills and dry screened to effect a separation of mica from the "sands."

Water Power Driven Plant of Diamond Mica Company

There is one new dry grinding plant in the area, which will serve to illustrate how the mica is generally



Above: Screen which splits dried mica at 14-mesh and rejects plus 8-mesh at the Victor Mica Co. Inc., plant. One air table is fed 8-mesh to 14-mesh, and the fines go to another air table for separation of mica from fine sands



Below: Air table which separates dried mica from sands. In operation, sand catches in the riffles, mica comes over end of table as air stream is blown through gabardine cloth by blower, to the left

Micronizing machine by which steam under high pressure is used to pulverize mica to 3000-mesh equivalent or less. Note screw feeder from hopper and steam lines into machine

processed. The plant is operated by the Diamond Mica Co. and is owned by R. T. Dent, of Spruce Pine, N. C. Production started in 1940.

Raw material is muscovite mica that has been washed and rid of sand and other impurities at the mines in Yancey County, west from the plant. The mica is a flake mica with a top size equal to one's thumbnail.

The mica is loaded from bins into wheelbarrows which are dumped into two open top hoppers, from which gravity carries it to two hammer mills on the ground floor. A ratchet feeder regulates the flow into each of two No. 10 hammer mills manufactured by the Meadows Mill Co., North Wilkesboro, N. C. The bulk of the reduction is accomplished through these mills. A fan-induced draft elevates the mill-run product to overhead cyclones, where the collected mica is split to four No. 7 Rotex single-deck enclosed oscillating screens. Screen cloths range from No. 4 to 100-mesh openings to correspond with various specifications.

Oversizes are put through a Gruendler No. 1 finishing hammer mill and the discharge from this mill is drawn by fan suction into the main duct from the primary hammer mills to the overhead cyclones. Throughs from the vibrating screens drop into bins as finished products and are bagged out by Wolf flour packing machines. Production of the plant is 10 to 12 tons of ground mica in 24 hours, 75 percent of which is sold to the asphalt roofing trade.

A unique feature of the plant is that it is entirely driven by water power. The North Toe river adjoining the plant has been dammed up and a 40-in. Leffel-Sampson vertical turbine developing 135 hp. is rope-connected to a single main-line shaft from which belts are run to all the moving plant equipment. The plant utilizes about 45 percent of the available power.

This concern oil-sprays some of the mica before bagging, since some of the asphalt roofing manufacturers are beginning to object to dust in their plants. A light, low-grade oil is sprayed through the mica stream as it comes from the screens, when customers require it.

Flotation

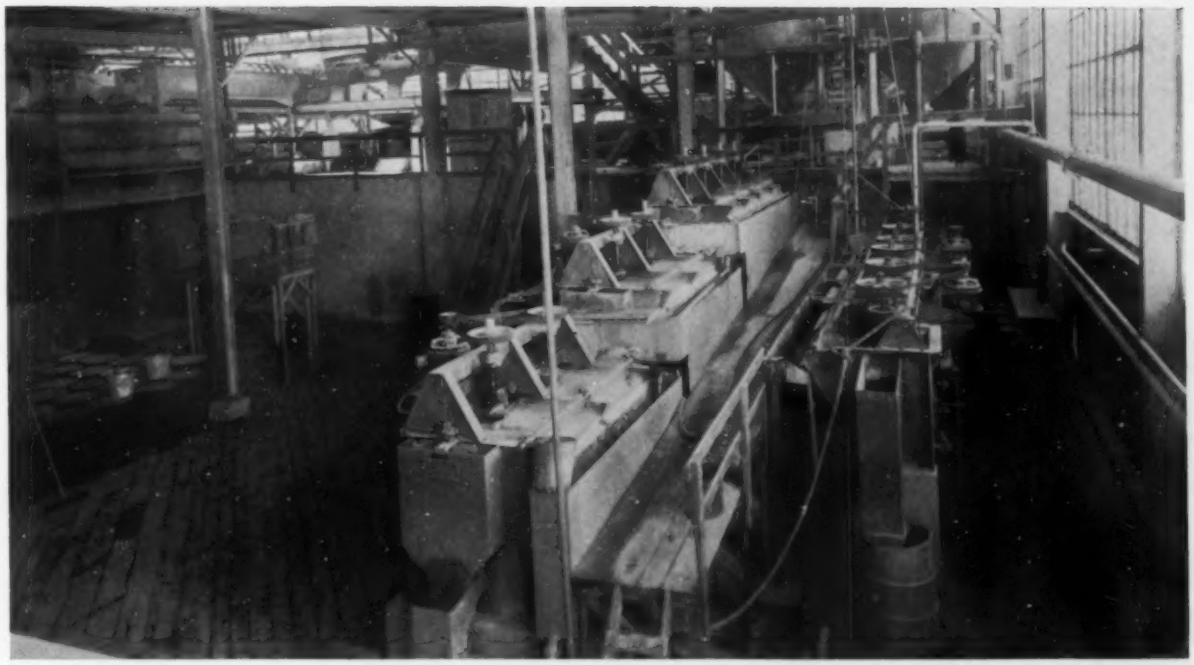
Flotation was first introduced in the Spruce Pine area by the Harris Clay Co. at its Sparks plant and more recently Kaolin, Inc., has placed in operation a flotation plant. Both these concerns are principally producers of high grade kaolins from primary deposits, which are used by the ceramic industries.

The kaolin deposits are a product of weathering and consist principally of clay, with feldspar, silica and mica contained throughout. Mica ranges from 5 to 10 percent in the deposits of Kaolin, Inc. Mica must be removed in making kaolin, along with other foreign minerals, and is being recovered and separated from the sands by flotation as a valuable by-product.

Kaolin, Inc., recovers some mica (plus 50-mesh) over Tyler-Niagara vibrating screens, and uses a Deister Plato concentrating table and flotation cells for further recovery of the finer mica from sand. This plant has six Denver Sub-A flotation cells and a battery of eight Minerals Separation "Air Flow" cells of a new type. At times feed as low as 200-mesh is treated by flotation, with suitable reagents, to recover most of the 325-mesh mica. Mica recovered in both these plants is sold principally to the asphalt roofing paper makers.

Micronized mica is the newest product placed on the market in the Spruce Pine area and its introduction

Left: Finish pulverizer for mica at Diamond Mica Co. plant is fed oversize from screens which size mica which previously had been put through two primary mills. Suction is used for elevation to screens. Note feed hoppers in front for feeding primary mills below. Right: One of the two primary hammer mills fed from overhead storage through hoppers



Flotation machines for recovery of mica at the plant of Kaolin, Inc., Spruce Pine, N. C. Each battery of flotation cells may be operated independent of the other

has opened new markets for its producer,—The English Mica Co. Micronized mica is a product ground to finenesses unheard of until recent years and is used principally in manufacturing high grade paints and varnishes, as a reinforcing pigment and flatting agent.

Making "Micronized Mica" at The English Mica Co. Plant

The English Mica Co. has been granted an exclusive franchise by the International Pulverizing Co., Moorestown, N. J., to manufacture micronized mica with its machine. Products are produced so fine that 100 percent will pass 325-mesh, or the equivalent of 1000-mesh, 2000-mesh or even 3000-mesh (8 or 10 microns) by the use of super-heated steam and the attrition of particles of mica against other particles, inside the micronizing machine.

The machine has no moving parts, but has a number of steam ports on the inside through which steam is injected to strike the incoming mica in its path and drive the particles against each other at high speed to cause them to shatter.

Reduction is controlled by the regulation of steam pressures developed in a 100-hp. boiler, stoker-fired, which has automatic features to maintain a given steam pressure within close limits. A 2-lb. pressure variation "kicks" the stoker in after a top pressure limit has cut it out.

Feed material must be dry and 550 deg. F. of superheat is maintained, regardless of pressure, to keep the inside of the machine dry while in operation. Feed size is limited to a top of 6-mesh, which is about the largest size that can enter the micronizing chamber through radial ports. Mica is fed out from a hopper by a small screw feeder into a connecting pipe going into either side of the chamber, and steam is introduced near the feeder spout to inject the mica into the machine. The two streams of mica and steam enter from opposite sides of the machine and additional steam to create the high speed swirling motion necessary for grinding is introduced directly into the chamber through another steam line.

Pulverized mica is continuously trapped out the bottom of the micronizing machine in such a way as to hold the steam pressure and is bagged direct, or first put over silk bolts, to remove scale or fibers, before bagging. Finished products are shipped in 50- or 100-lb. bags.

Feed material consists of dried water-ground muscovite mica of local origin of various sizes less than 6-mesh, biotite, or a white mica imported from South Dakota which is used in fine white paints. All abrasive material has been removed from any of the feed materials.

Steam pressures are changed and maintained to manufacture the micronized micas of different finenesses. Steam pressures are varied from 15 p.s.i. on up as greater finenesses are desired. Production is four tons in 24 hr. of a product with 100 percent passing the equivalent of 3000-mesh.

Local muscovites are so processed for use in many types of paints. Biotites are similarly ground as fine as 3000-mesh equivalent for use in greases, for use in finishing leathers and other applications.

Micronized mica is too fine to test for gradation by ordinary methods, and samples are sent to a New York laboratory where photomicrographs with magnifications as high as 1000 or 1500 times are made on cross-section paper to measure particle sizes.

Micronized mica is the result of experimental work conducted by The English Mica Co. to find ways to produce a whiter mica with lower oil absorption, a thinner mica flake and a particle size more closely approximating that of modern paint pigments. The product is sold under the name "Micronized Mica."

Tests by commercial laboratories have indicated that micronized mica has a specific gravity of 2.82, a maximum of easy wettability, a large percentage of colloidal material, high lubricating properties and many other qualities desirable in high grade paints. These tests indicate that the use of micronized mica in paints makes the film stronger and more flexible, and reduces checking.

Process Feldspar For Glass

Requires tight setting of crusher and accurate regulation of the circulating load between screen and crusher

AFTER MANY YEARS of operation mining crude feldspar, the Virginia Feldspar Co., Bedford, Va., has built a plant to manufacture granular feldspar for the glass trade. The plant is located in the city of Bedford about 10 miles distant from the mines.

Feldspar for making glass is minus 20-mesh with a minimum of extreme fines, and its price is established on the basis of its chemical qualities and on how closely it conforms in size grading to this standard. Virginia Feldspar Co. is using a 3-ft. Symons short-head cone crusher and a 3- x 10-ft. Screen Equipment Co. "Seco" screen with about a 1000 percent circulating load to produce this product, which is a rather unusual installation employing this principle of crushing.

Feldspar trucked from the mines is dried out long enough under a shed at the plant to reduce the surface moisture to a maximum of 0.4 percent in preference to drying the stone before pulverizing. Storage capacity under cover is about 1000 tons.

Size of stone, previously selected and hand-graded at the mines, is such that it can be fed into a 10- x 18-in. Good Roads jaw crusher. Handling into the crusher from storage is done by wheelbarrow, and the reduction for feed into the grinding circuit is 1¼-in. minus.

Grinding efficiency depends to a considerable extent upon dryness of feed. The plant is therefore equipped with a coke-fired stack dryer to remove excess moisture should there be an insufficient length of time for storage under cover. Feed for the cone crusher is elevated into a surge bin of 14-ton capacity.

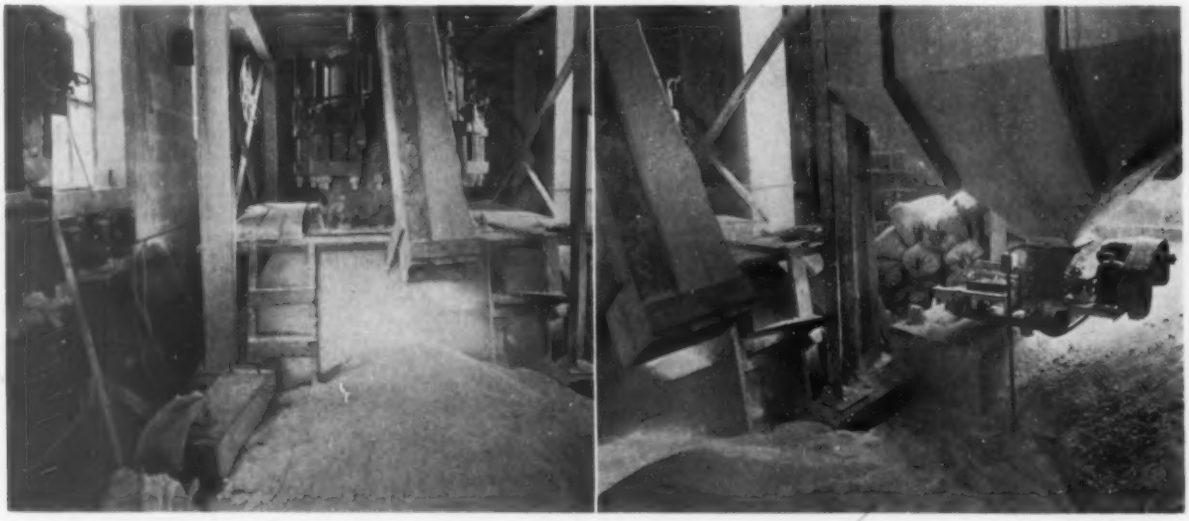
Large Circulating Load and Tight Setting of Crusher

Grinding is done by combination of a tight setting of the crusher and accurate regulation of the circulating load between the screen and the crusher to produce a product 99.5 percent passing 20-mesh, with 75 percent between 20-mesh and 100-mesh and a maximum of 15 percent minus the 200 mesh. It is of importance to keep the 200-mesh to a minimum.

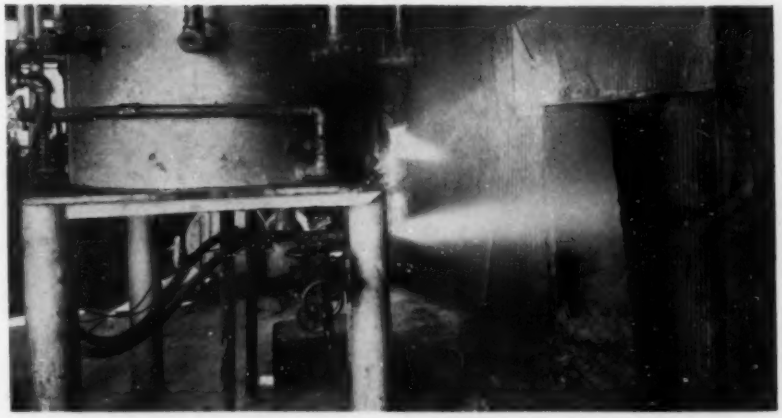
Use of a large circulating load is the means of producing granularity of product since each piece of feldspar is theoretically subjected to ten fractures, in carrying a circulating load of 1000 percent. It is necessary to keep the circulating stream constant to produce a uniform product. The control, regulated by a Hardinge constant weight feeder, is in the feed to the bucket elevator which puts material over the screen.

The screen is double-decked, with $\frac{3}{16}$-in. sq. openings on the top deck and 18-mesh openings with 0.20-in. wire on the bottom deck. Excessive wear on the bottom deck cloth is prevented by having a top deck. Throughs from the lower screen surface drop into a steel bin and the overs enter the crusher. Frequency of screen vibration has been increased to 1370 r.p.m. and the throw has been cut in half, with very satisfactory results in the elimination of blinding and accurate sizing with the type of material being fed.

Setting of the crushing cavity is so close, in producing a product so fine that it approaches a ground material, that the manganese linings of the mantel and bowl are apt to warp if operated without load, according to operators of the plant. To safeguard against this possibility, the sequence of starting the machinery up is such that material is dropping



Left: Cone crusher closed-circuited with vibrating screen to produce ground feldspar. Right: Surge bin and constant weight feeder which regulates circulating load in grinding circuit



Close-up of new water-jacketed cupola showing wheel and ratchet for directing steam jet into melt. Note that molten stream is split and blown into collecting chamber on right

Making a Finer Rock Wool

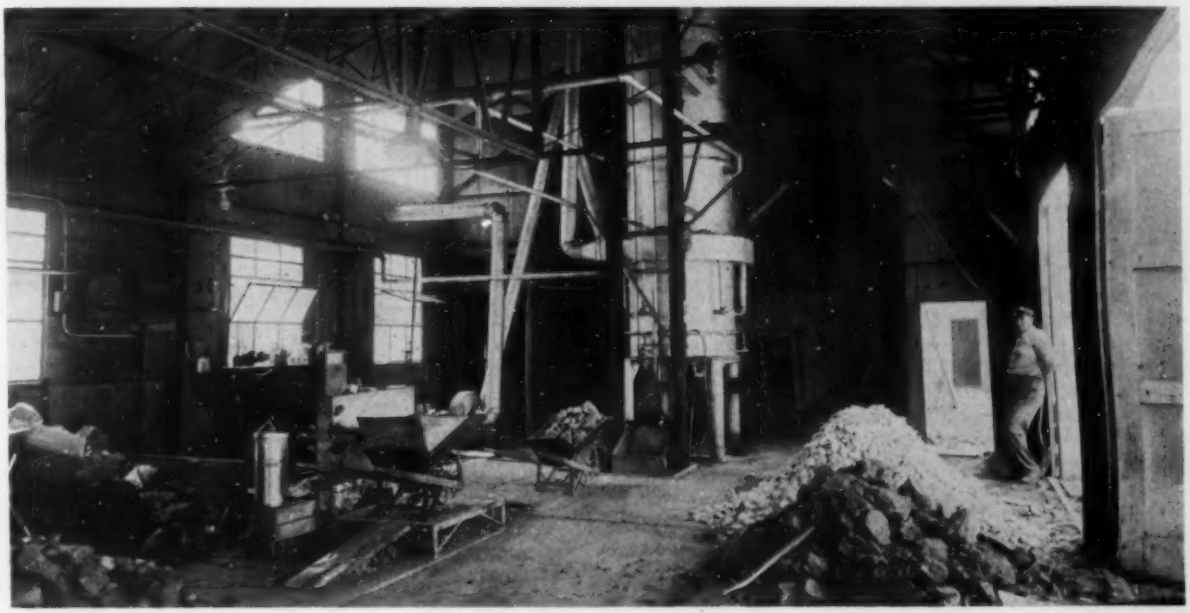
Waukesha Lime and Stone Co. installs new cupola, and improves method of rock wool manufacture and preparation of bats

ROCK WOOL manufacture has been more or less in an evolutionary stage for the past two years at Waukesha, Wis., where the Waukesha Lime and Stone Co. built a plant in 1939. Out of two years' experience in the proportioning of raw materials and in the melting and blowing of wool, there has been developed a more efficient plant than the original layout. Along with improved plant practice, the quality of the product has been continuously perfected.

The first attempt to make rock wool from limestone and other materials available locally was an experiment. Compressed air was used to fiberize the wool in a local grey-iron foundry, which uses limestone produced by the company as flux.

These experiments proved conclusively that a good grade of rock wool could be manufactured from the materials at hand. Then the plant was built in 1939 and recently changes were incorporated which have perfected the process.

As built in 1939, the plant was typical of many others in operation. It had a vertical cupola, a blowing



Rock wool manufacturing plant, showing new cupola in the center with skip bucket to elevate wheelbarrow loads of materials which are weighed on scale in the foreground. Induced draft fan may be seen to the left

General view of rock wool plant. Storage building on left for finished wool

chamber and a continuous conveyor equipped with cutting knives, to produce loose wool and granular wool and to make insulation bats. A new pre-fabricated steel building was erected for the purpose.

This plant as built had developed a capacity up to 11 tons of rock wool in 24 hr. The cupola was made from a 48-in. diameter boiler shell lined with ordinary fire brick, with cooling water sprayed constantly over the outside of the shell around the melting zone. Alternate layers of raw materials and coke were fed into the top of the cupola by a skip bucket and an air blast to support combustion was introduced through ports by a 30-in. Bailey centrifugal fan into the melting zone.

A 75-hp. hand-fired boiler developed steam under high pressures to blow the wool into a collecting chamber through nozzles of V-shaped section. Capacities up to 12 tons in 24 hr. were arrived at by splitting the molten stream from the cupola into two separate streams, with steam from two separate nozzles fiberizing the material as it was blown into the collecting chamber. At the start, capacity was only five tons a day.

Reduce Fuel Consumption By Plant Improvements

In its entirety, the plant has not been changed much since it was built. However, the cupola has been replaced by a new one of like size that is water-jacketed, and in connection with the new cupola certain important economies have been realized.

This cupola consists of an unlined inner shell, fabricated of $\frac{3}{8}$-in. firebox steel, with an outer shell made from $\frac{1}{4}$-in. boiler plate. Cooling water is circulated between the two shells by one of the quarry pumps at the rate of 20 to 30 g.p.m.

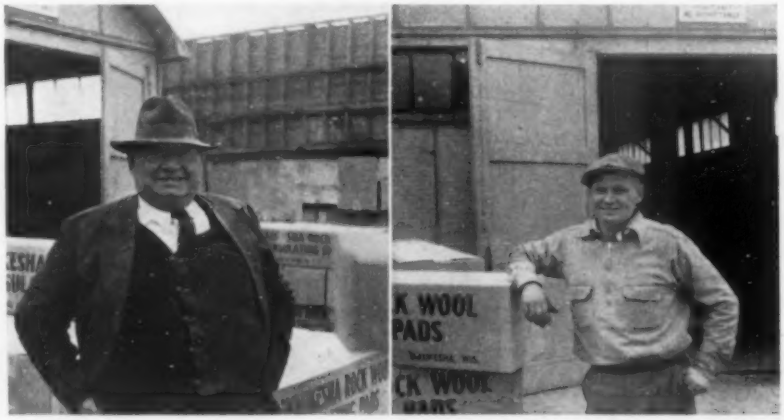
In the process of cooling the shell, the circulating water is heated to a maximum of 200 deg. F. and then becomes part of the boiler feed water. By using pre-heated boiler water, the plant coal consumption has been cut from 230 lb. an hour to 180 or 190 lb. A stoker to be installed is expected to reduce the coal required by an additional 25 percent.

Another important saving has been made by pre-heating the blast air for combustion within the cupola. About 1200 c.f.m. of air is forced through the melting zone within the cupola by the Bailey fan, which has a capacity of 2000 c.f.m.

bucket. When all the ingredients are dumped, a cable hoist raises the skip to dump into the cupola through a chute near the top. Proportions of the feed material are such to approach an approximate analysis of 40 percent SiO_2, 20 percent Al_2O_3, 20 percent CaO and 20 percent MgO.

Coke for the fire is a 4-in. special cupola lump, of high volatility and low in ash. It is also desirable to have sized feed materials that are free from fines, to facilitate the draft and to prevent segregation which would lead to uneven draft conditions and irregular melting. Limestone is a uniformly sized 3-in. product from the commercial crushed stone plant. Slag is obtained in large chunks which are broken down by lifting them with a crane and dropping them to shatter. Average size used in the mix is 6-in. Quartzite is also of uniform size without fines. These materials are mixed fairly well in handling and in the process of dumping into the cupola.

Temperatures of the melt at discharge from the cupola for blowing



Left: Fred C. Wolf, vice-president and general superintendent. Right: Clarence Wolf, his son, superintendent of the plant

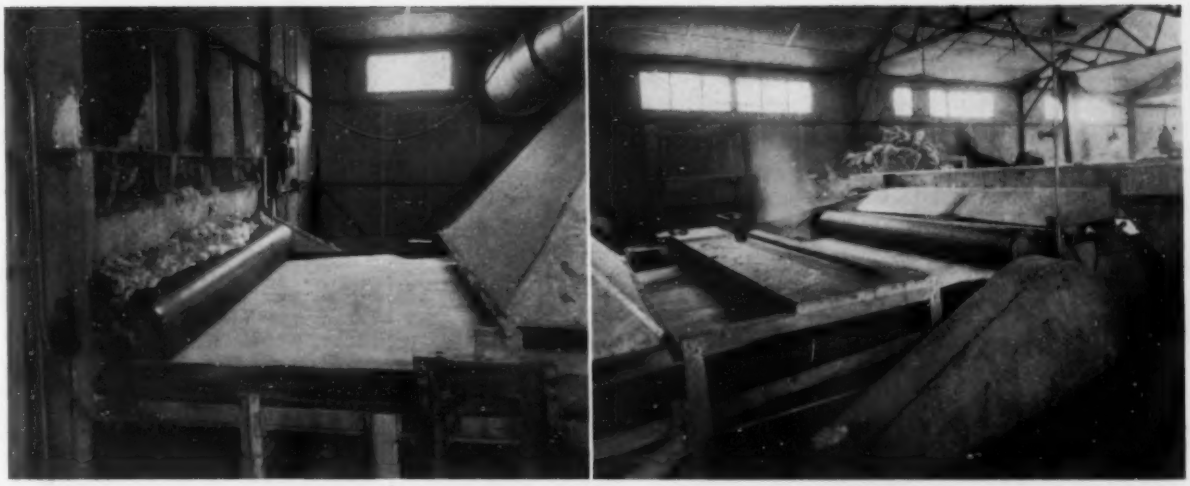
Waukesha Lime and Stone Co., principally a producer of crushed limestone, went into the rock wool business as another outlet for crushed stone. Its quarry contains limestone strata of varying chemical composition. By selective quarrying, limestone for rock wool manufacture is gotten out that contains, on an average, 53.3 percent $CaCO_3$, 43.4 percent $MgCO_3$ and 2.4 percent SiO_2.

Other raw materials mixed in with this limestone are blast furnace slag for silica and $CaCO_3$, a Portland quartzite for SiO_2 and scrap glass when available locally to replace part of the quartzite. The slag averages about 75 percent SiO_2 and the quartzite 80 to 85 percent.

Each material is weighed separately in a wheelbarrow on a Fairbanks scale and is dumped into a skip

range from 2800 deg. F. to 3200 deg. F. Heat intensity is varied by adjusting the volume of air forced through the bed in the cupola. Steam pressures for blowing range from 85 p.s.i. to 110 p.s.i. to produce the most ideal fiber length and to still hold down the percentage of shot. Splitting the melt into two thinner streams for blowing is also helpful in eliminating shot. Each of the two steam nozzles is adjustable, through a wheel and ratchet, to change its direction up or down or laterally. Having this positive means of directing the steam jet into the melt is a detail in operation that has proven invaluable in the fiberization process. Shot in the product is very small and is well below permissible amounts by weight.

The collecting chamber is very similar to those used in many other



Left: Roller compressing blanket as it emerges from chamber. Roller height is adjustable to vary thickness and density of bats. An additional roller has been installed since this picture was taken to further compress the blanket. Right: Showing one of the rollers resting on wool blanket. Steam rising on the opposite side of conveyor is from "hot" roller underneath

plants, but the arrangement for cutting bats is highly perfected. Fibers of wool settle in a loose blanket inside the collecting chamber on a flat steel slat conveyor which is, in effect, a moving floor in the chamber. The chamber measures 16- x 20-ft. in vertical section and is 60-ft. in length.

Wool is slowly moved out into the cutting and packing room on the conveyor as a continuous operation. The loose wool is compressed into a large blanket of desired thickness and density by adjustable rollers as it is conveyed toward the cutting knives. One of these rollers is located where the wool emerges from the chamber and it also serves to seal the collecting chamber. There are also two others at the far end of the conveyor.

The conveyor has a variable-speed drive, consisting of a 3-hp. 1750 r.p.m. Allis-Chalmers motor with a 20,000:1 gear reduction. This drive and the up or down adjustment of the compressing rollers are the means of regulating the thickness of the blanket and for changing from one thickness to another. Bats are made in 2- and 3½-in. thicknesses measuring 15- x 24-in. in size.

At the far end of the blanket from the collecting chamber, the metal conveyor transfers to six short conveyors parallel to the length of the main conveyor. Over these belts, seven circular discs on a single shaft turn at a high rate of speed in a vertical plane between the six conveyors to slice off six 15-in. widths of wool. Edges trimmed off are put through a granulator. Granulated wool is sold in bulk.

An automatic cross-cut saw of original design is timed according to the movement of the main conveyor to cut the strips of wool into bats 24-in. long. It consists of a 22-in. circular blade connected to the shaft of a 3-hp. reversible motor turning at 1750 r.p.m. A drive shaft is attached to and driven from the motor by chain and gears to support the entire assembly on parallel gear tracks spanning across the conveyor. Twenty-four inches of travel of the rock wool conveyor automatically trips an electrical contact and a clutch is engaged automatically to the drive shaft at the proper motor speed to send the blade across the blanket of wool. Near the end of the gear track, a switch is tripped and the carriage is stopped by a spring bumper. The following 24-in. of travel of the conveyor sends the saw back in the other direction, with the motor turning in the reverse direction.

Bats are packed in cardboard boxes holding 25-sq. ft. of the standard 4-in. bat. Loose wool is made by raising the compression rollers over the conveyor and is packed in cloth bags.

About 60 percent of the production of rock wool bats is made plain, the rest having a paper covering on one side. This paper has one sticking surface and is threaded from a paper roll between the under side of the bats as they come off the conveyors and a roller which is heated through its length by live steam from within. The heat melts the gummed surface of the paper so that it will adhere to the wool.

Loose rock wool is treated with lubricating oil to make it dustless, and various types of chemicals are used as binders. Among them are solutions with bases of melted resin and creosote. These chemicals are blown into the mass of fibers as the wool is blown into the collecting chamber, but from a separate nozzle.

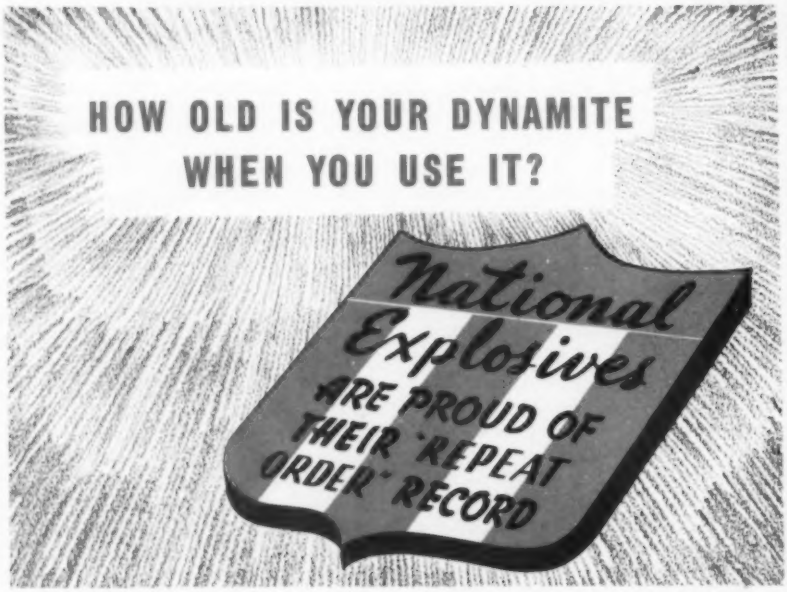
End of conveyor showing six widths of bats coming to the operators for boxing. Note cross-cut saw directly across table, ventilator hood in the background, and piles of trim, to the right, which are granulated

Fumes from the various chemicals are exhausted from the packing room through a hood over the wool blanket on the conveyor. The hood is connected by a duct to a 2700 c.f.m. exhaust fan.

Future Improvements

Since the original plant was built, a 52- x 82-ft. warehouse has been built, which will accommodate a week's run of the plant. A second roller near the first one over the conveyor has been installed, for further compressing, since the wool when first compacted tends to "spring" back into its original loose state.

It is planned to house-in the conveyor and to make changes to the conveyor to dry the wool before cutting it and then to cool it, first by a blast of heated air and then by a blast of cold air. Fans will force the air through the wool blanket on the conveyor. This is desired in order to maintain a uniform product as shipped in boxes. Otherwise the lowest bat in the box becomes compressed and assumes a thickness that makes it too dense.



Frequently lack of uniformity in blasting is blamed on some alleged "unknown change in rock structure," supposed to have occurred behind the quarry face. Actually, in all probability, the REAL reason for the lack of uniformity in the shooting, is OLD dynamite.

Old, or stale, dynamite certainly can be inefficient. Moving explosives from the manufacturer's plant to his plant magazine, to his field magazine and from there to the customer's magazine, usually means a period of as many as eight months. During this time it may be exposed to changes in temperature, humidity and the like, resulting in lessened strength and effectiveness.

NATIONAL explosives are shipped direct from our plant to the customer FRESH and 100% efficient, within 12 to 48 hours after receiving the order.

Write today for more information about National Explosives. Take advantage of our years of practical experience.

NATIONAL POWDER COMPANY

ELDRED, PENNSYLVANIA

(McKEAN COUNTY)

POWDER NATIONAL COMPANY

Waukesha rock wool is sold principally in the Milwaukee area and in nearby counties. The bulk of the sales are through insulating contractors. The plant was designed by Fred C. Wolf, vice-president and general superintendent, and Clarence Wolf, superintendent. Most of the equipment was built in the company's shops.

Rock wool is just one of many products of the Waukesha Lime and Stone Co. The company has been in business for 36 years and has built its business on a policy of diversification. The products include sand and gravel, crushed stone aggregates; flux stone; paving and rip-rap stone; pulverized stone for agricultural stone and for asphaltic surfacing; "sealcote" stone, chips and screenings; poultry, chicken and canary grit; standard and non-slip barn lime; terrazzo stone; hand cut random ashler veneer building stone; rubble stone; Io-Cal, a health-building cow food which is an iodized tube-milled 200-mesh limestone and others. The company is headed by Mrs. M. O. Gillen, president and general manager.

Talc Industry Grows

SALES OF TALC, pyrophyllite, and ground soapstone reached another new high in 1940, exceeding the peak of 1939, by over 27,000 short tons.

The total sales, as reported to the Bureau of Mines, were 281,375 short tons valued at $3,008,320, increases of 11 percent in both quantity and value over 1939. Sales of all classes increased in quantity and value, the greatest increase being in the sales of ground products.

Eleven states reported sales of talc, pyrophyllite, and ground soapstone (and a little pinite) in 1940 compared with 1939. Eight of these states, located in the East, supplied 86 percent of the sales; Western States accounted for the remaining 14 percent. All time highs were again established in California, Georgia, North Carolina, and New York. New York was by far the leading state, with California, North Carolina, and Vermont of about equal importance, but each supplying only about a third as much as New York.

Five industries — paint, ceramics, roofing, paper, and rubber—consumed 75 percent of the talc, pyrophyllite, and ground soapstone of domestic origin. The paint industry—the leading market for these materials—took only 24 percent of the total sales in 1940 as compared with 27 percent in 1939. The ceramic industry increased its hold on second place, while rubber dropped to fifth place in 1940 after being tied with the roofing and paper industries for third place in 1939.

Processing Feldspar

(Continued from page 52)

into the crusher when the 50-hp. motor driving it is started. Capacity of the finished product is four tons per hour and bin capacity is about 55 tons. Shipments of granular feldspar are ordinarily made by rail with direct loading into cars out of the bin. It is anticipated that the new plant will grind 500 to 600 tons of feldspar per month.

Keep Down Iron Content

Iron content is about .05 percent in the unground feldspar as delivered from the mines, which would build up to as high as .12 percent in the grinding process if certain precautions were not taken. A magnetic pulley ahead of the jaw crusher takes out of the stream much of the iron originating in various stages of production, such as miscellaneous nuts and bolts, iron coming from handling in trucks, from the sledging operations, and the use of forks in the mines. All chutes in the plant are also rubber-lined, the net result being a product of .075 percent maximum iron content.

The grinding plant is housed in a new, practically dust-tight, building of cinder concrete masonry construction. Operations are so near to being fully automatic that workmen only on occasion enter the building during operation.

Potash feldspar comprises the bulk of the ground product, but some of the soda-lime variety is also pulverized. Potash feldspar predominates in the vein being worked by the company in its Cedar Ridge quarries. The vein is an intrusion of feldspars in a quartz matrix that extends 700 ft. in length. Its width is 90 to 95 ft. and it occurs to considerable depth between vertical side walls. This vein has all the general characteristics of the larger deposits in Bedford county, which consist of an almost complete segregation of minerals that makes it easy to separate the several feldspars by appearance.

An open pit bench method of mining is used, and the feldspar is raised out of the mine vertically by a steam-driven derrick and bucket for separation into the several varieties. Probably 15 percent of the output of crude feldspar, which comprises the bulk of the business, is soda-lime feldspar. Geology and features of this particular vein and others in Bedford county were discussed in detail by R. H. Patterson, manager of operations, in an article, "Feldspars of Virginia," that was published in ROCK PRODUCTS, September 12, 1931, pp. 42-45.

Phosphate By-Product

IDAHO STATE bureau of mines and geology reports that vanadium oxide is being produced for the first time from Idaho ores by a process developed at the Anaconda Copper Mining Co. phosphate rock mine at Conda, Idaho. It had been discovered that the phosphate rock carries 0.05 percent vanadium oxide. The importance of vanadium to the production of special steel alloys, needed for defense purposes, induced Anaconda to develop a process for its recovery as a by-product to phosphate.

Arizona Asbestos

J. S. COUPAL, director of the Arizona Department of Mineral Resources, has made a detailed survey of the possibilities of asbestos production for national defense purposes, in the asbestos area north of Globe, Ark.

A large asbestos company in the East has been awarded a federal contract for $5,000,000 worth of Arizona asbestos and is said to be ready to prepare for production.

New dust-tight grinding plant and storage shed for unground feldspar received by truck

Made of Acid Open Hearth Steel Wire

Round Strand
Flattened Strand
Preformed
Steel Clad
Non-Rotating

The Service Record of this wire rope continues to make and hold friends.

MADE ONLY BY
A. LESCHEN & SONS ROPE CO.
Established 1857
5909 Kennerly Avenue St. Louis, Mo.
New York — Chicago — Denver
San Francisco — Portland — Seattle

WHILE THE SECO VIBRATING SCREEN HANDLES EQUALLY WELL ANY KIND OF COARSE OR FINE SCREENING, THE VERY NATURE OF ITS CONTROLLED CIRCLE THROW MOTION, AND THE RESULTANT SHARP ACTION OF THE GYRATING BODY, GIVES IT A DEFINITE ADVANTAGE IN SCREENING FINER AGGREGATES.

ALSO, FOR THE ABOVE REASON, A SECO WILL OPERATE EFFICIENTLY AT A LOWER DEGREE OF INCLINE THAN OTHER VIBRATING SCREENS OF THIS TYPE.

Screen Equipment Co.

U. S. Largest Consumer of Barite

THE UNITED STATES appears to be the world's largest barite market (now taking at least 400,000 tons a year), consuming not only its own large production but also the considerable quantities imported. The markets for crude barite in the United States are (1) in the Atlantic Coast States, (2) along the Pacific coast, and (3) in the central and northern parts of the Mississippi Valley. Markets for barite exist in the crushed- and ground-barite, lithopone, and barium chemical industries of all these regions.

About 60,000 tons of crude barite is consumed annually on the Pacific coast, and the balance of the domestic yearly consumption is taken by the various markets in the Central and Eastern States. California processes and consumes the larger part of the western production of barite (and witherite). The Colorado market (sugar industry) is supplied partly from Colorado and partly by imported witherite. The Kansas lithopone industry draws upon Colorado and Missouri; Missouri consumes most of its own product, sending some to the North Central States, which also draw on the southern barite-producing region. The Atlantic Coast market is supplied by the southern barite region and by imported barite.

The relative importance of the various outlets for crude barite has been changing in recent years. Lithopone, which formerly consumed more barite than all the other industries put together, has recently yielded first place to ground barite, which in 1938 consumed over half of the barite used in the United States. The manufacture of barium chemicals alternated with the production of ground barite for second place for a few years before 1934, when the use of ground barite for oil-well drilling began to develop on a large scale. During the last decade the output of lithopone has diminished, whereas the total requirements of the barium chemical manufacturing industry has fluctuated irregularly.

Only a portion of the crude barite requirements of domestic consumers is purchased in the open competitive markets, as several of the largest consumers or processors of barite have their own mines. Actual sales are mostly on a contract basis. No standard tests or specifications for crude barite have been widely accepted. Minimum barium sulphate content and maximum iron content, however, are specified in all transactions, and in some instances the grain size is also specified. Crude barite of commercial grade usually analyzes at least 93 percent barium sulphate, and the better grades carry at least 95 percent. Barium chemical plants are said not to accept ore of less than 90 percent $BaSO_4$, provided the specific gravity is about 4.2 or better. Specifications for the glass trade are more exacting than those of other barite-consuming industries. — Information Circular 7149, U. S. Bureau of Mines.

Future Possibilities in Dolomite

ACCORDING to sources believed to be reliable, production of magnesium in greater Germany during 1940 increased to between 16,000 and 19,000 metric tons. Germany employed carnallite, potash end-liquor, and some magnesite and dolomite as raw material in the production of its magnesium. The electrolytic magnesium chloride process was employed, but experiments were begun recently on the direct thermal reduction of magnesium oxide.

Owing to local lack of certain other metals, Germany uses magnesium for telephone switch parts, optical instruments, microscopes, bus bars, and aerial bombs. Copper-zinc alloys have been replaced by magnesium alloys in the manufacture of engraving plates. Automobiles, street-cars, and tanks are understood to offer some of the most important outlets for the present German supply of magnesium alloy.

The United States has immense deposits of dolomite, stretching from western Massachusetts to the Middle West.

Defense Activities Stimulate Fluorspar

STIMULATED by defense activities and by a sharp curtailment in imports, the fluorspar industry in the United States increased production substantially in 1940 to meet the demand of American consumers, according to final 1940 figures made public today by the Bureau of Mines, United States Department of the Interior.

Greatly expanded operations at steel mills and aluminum plants in 1940 have so prompted the demand for fluorspar that total shipments of that mineral from domestic mines during the year were the second highest on record. Domestic mine production was 41 percent higher and shipments 28 percent greater in 1940 as compared with 1939, the Bureau stated.

It was pointed out, however, that shipments of fluorspar were in excess of consumption, and as a result consumers' stocks at the end of 1940 were 14 percent greater than in the previous year. Moreover, stocks at mines or shipping points were also about 14 percent higher than in 1939. For the same comparative periods sales of imported fluorspar in the United States dropped 41 percent.

Steel mills, the Bureau reported, are the principal consumers of fluorspar, and large quantities also are used in glass and enamel manufacture, and in the production of hydrofluoric acid which is essential in the manufacture of artificial cryolite, an aluminum raw material.

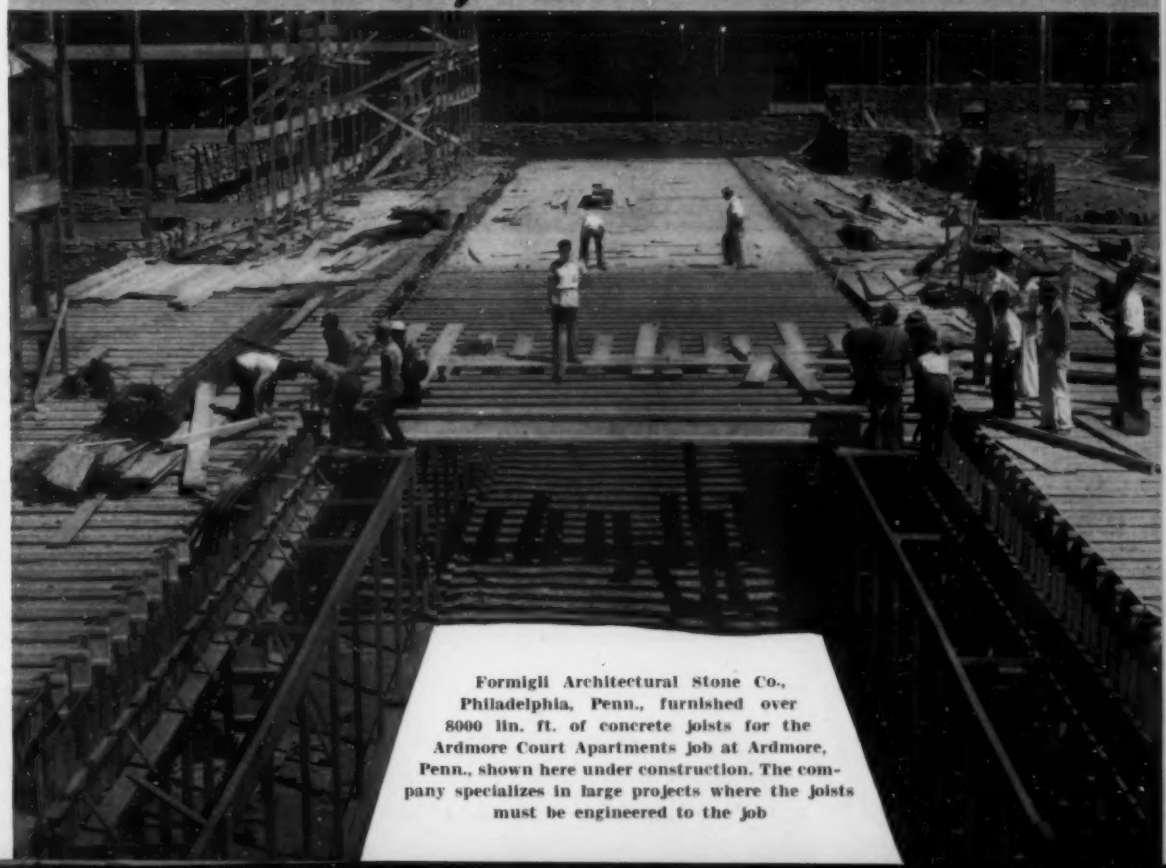
The following tables show, for 1939 and 1940, details of the shipments of fluorspar by states and uses, imports by countries and uses, and consumption by industries.

FLUORSPAR SHIPPED FROM MINES IN THE UNITED STATES, 1939-1940, BY STATES

State	1939			1940		
	Short tons	Value		Short Tons	Value	
		Total	Average		Total	Average
Colorado	7,569	$ 107,459	$14.20	11,032	$ 163,285	$14.80
Illinois	75,257	1,638,693	21.77	104,698	2,313,747	22.10
Kentucky	89,563	1,773,063	19.80	103,939	2,043,866	19.66
Arizona, New Mexico	6,447	132,408	20.44	7,986	139,675	17.49
Nevada, Utah	3,520, 385	53,336	13.66	5,803, 142	84,235	14.17
	182,771	$3,704,959	$20.27	233,600	4,744,808	$20.31

CONCRETE PRODUCTS AND CEMENT PRODUCTS

Big market for joists in large structures



Formigli Architectural Stone Co., Philadelphia, Penn., furnished over 8000 lin. ft. of concrete joists for the Ardmore Court Apartments job at Ardmore, Penn., shown here under construction. The company specializes in large projects where the joists must be engineered to the job

Vibrapacs are Meeting Universal Demands

Vibrapacs are in successful operation the country over using every type of aggregate under the individual conditions existing in each plant.

Blocks of just the desired density and texture to meet the demands of different localities and different construction purposes are being made on Vibrapacs.

From coast to coast Vibrapacs are doing a masterful job in helping to speed up general building expansion and defense building programs.

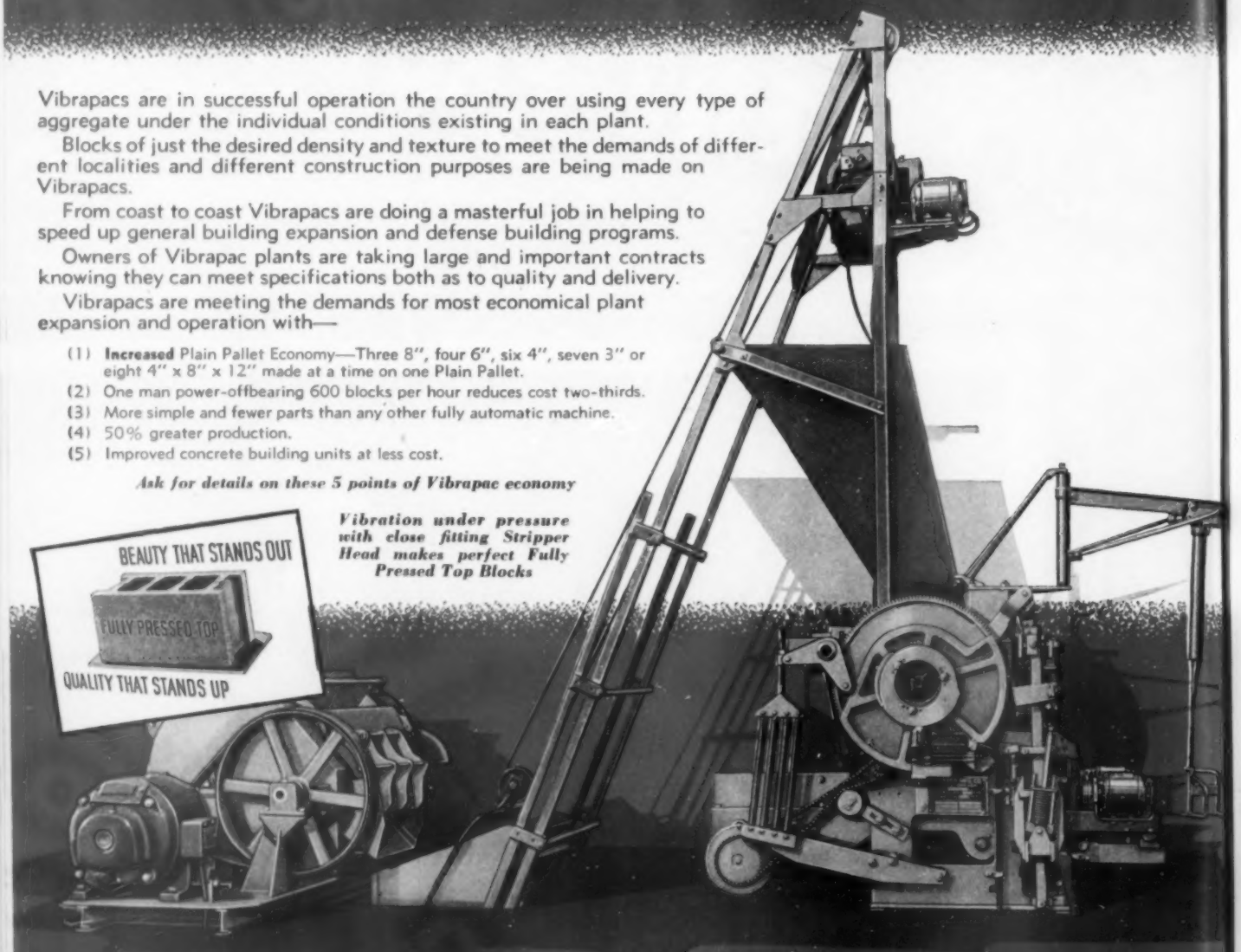
Owners of Vibrapac plants are taking large and important contracts knowing they can meet specifications both as to quality and delivery.

Vibrapacs are meeting the demands for most economical plant expansion and operation with—

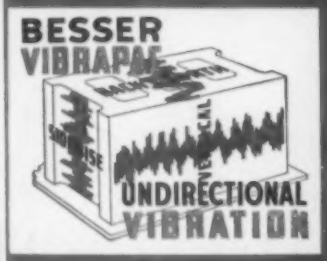
(1) **Increased** Plain Pallet Economy—Three 8", four 6", six 4", seven 3" or eight 4" x 8" x 12" made at a time on one Plain Pallet.
(2) One man power-offbearing 600 blocks per hour reduces cost two-thirds.
(3) More simple and fewer parts than any other fully automatic machine.
(4) 50% greater production.
(5) Improved concrete building units at less cost.

Ask for details on these 5 points of Vibrapac economy

Vibration under pressure with close fitting Stripper Head makes perfect Fully Pressed Top Blocks



Besser Super Automatic Plain Pallet Vibrapac with Mixer and Skip Loader. Capacity 600 8"x 8"x 16" per hour made 2 at a time on one plain pallet. Smaller units made in larger multiples on the same pallets.



Undirectional vibration under Flam patents (other patents pending) was employed to make the first vibrated blocks ever produced commercially. The Besser Vibrapac combines undirectional vibration with the exclusive Besser Plain Pallet principle. Users of these machines are fully protected under Besser and Flam patents.

BESSER PLAIN PALLET STRIPPERS

A Besser Plain Pallet Stripper For Every Need

TAMPERS	Besser Super Automatic	8 Hr. Capacity 3120
	Besser Victory Automatic	8 Hr. Capacity 2160
	Besser Semi-Automatic	8 Hr. Capacity 1680
	Besser Champion, Power Operated,	8 Hr. Capacity 1000 to 1200
	Besser Multi-Mold, Hand Operated,	8 Hr. Capacity 250 to 350
VIBRATORS	Besser Super Automatic Vibrapac	8 Hr. Capacity 4800
	Besser Victory Automatic Vibrapac	8 Hr. Capacity 2160
	Besser Master Vibrapac, Hand Operated,	8 Hr. Capacity 800

BESSER MANUFACTURING CO. • ALPENA, MICH.

209 FORTY-FIRST STREET

Complete Equipment for Concrete Products Plants

THE SAVING IN PALLET COST WILL PAY FOR A BESSER VIBRAPAC PLAIN PALLET STRIPPER

Big Business In A Small City

Sell concrete block, joists, floor tile, brick and pipe over a 75-mile radius

Above, right: Joist machine depressed for convenient filling of forms from mixer, in background

RAEFORD is a small city of 1800 people in the southern part of North Carolina, far from any large metropolitan areas, but that has not prevented the Hoke Concrete Works from "going places" in manufacturing and selling concrete products. The company has a modern, well-equipped plant and a diversified line of products and is doing a fine job of manufacturing quality products and *selling* them. Its accomplishments disprove any ideas that the best manufacturers and selling organizations are in the bigger cities.

The company operates over a 75-mile radius on most of its lines, with the exception of Stonex for which it has the exclusive sales and manufacturing rights for the entire State under license from Stonex Industries, Inc., Miami, Fla. In this 75-mile radius are a number of small towns and communities, which when taken together embrace a considerable market area that has been rapidly developed.

Off-Season Side-Line Becomes All-Year Business

Hoke Concrete Works is owned and operated by the Hoke Oil and Fertilizer Co. of Raeford, and was started just two years ago. Officers of the company were looking for a sideline business to keep the men on the payroll for four months of the year between cotton seed crushing seasonal cycles.

Concrete products is a far cry from cotton seed, but the concrete products business has been developed into a full-time separate business that now employs 40 full-time men and the plant is in operation on a 20-hour per day schedule. Very little of the sales volume is traceable to national defense construction, and the company is located in a part of the country where clay products have always been the accepted construction material. It takes good products and merchandising to accomplish what L. M. Upchurch, manager of the company, and his associates have done.

Make Various Products

It all started in 1939 when the separate company was organized to manufacture Dunbrik at the rate of 7000 brick in six hours. Later, a hand-operated Multiplex machine was purchased to make sand and gravel concrete block, and this was followed by installation of a second Multiplex machine and the addition of lightweight cinder concrete block. Both these machines have since been fitted with the Multiplex vibrator attachment and the plant is turning out 2000 block in 20 hours, either heavy or lightweight in 4's, 8's and 12's and fractions of the 8- x 8- x 16-in. standard.

To the left, L. M. Upchurch, manager, with his office staff, T. B. Lester and Archie Howard

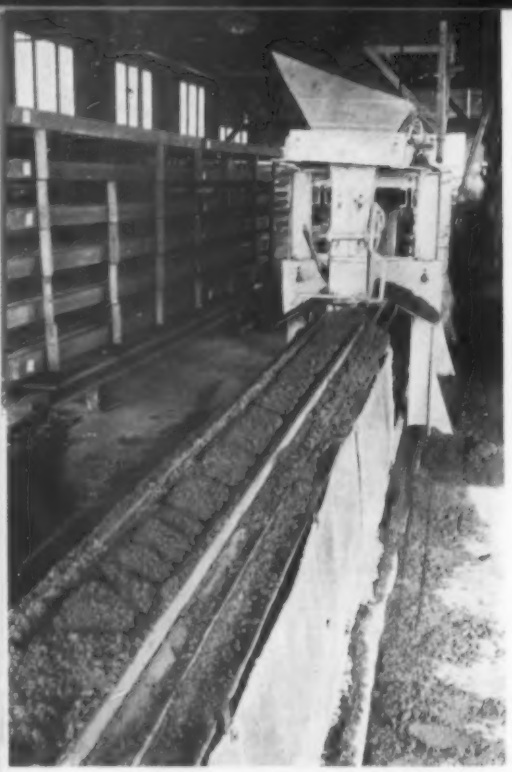
This was followed by the manufacture of sewer and drain tile, Stonex floor tile, concrete joists, lintels, etc., to make a flexible type of plant that has a reasonable capacity, in four major lines, to keep something moving all the time. Drain and sewer tile, without reinforcement, are manufactured in 4- to 24-in. diameters on a Champion tile machine that turns out 1800 ft. of the 4-, 6- and 8-in. sizes in 10 hr.

Stonex, a colored floor tile, is available in any uniform color or blend for decorative effect, in small sizes, and also up to 24- x 24-in. size for placement on concrete joists as a load-bearing unit. Hoke Concrete Works is very active in the promotion of this

(Continued on page 66)

Left: Mixing the batch of colored concrete, in background; casting the facing in foreground, using vibrating table. Right: Preparing the molds for casting floor tile

Making Joists of Pre-rolled Structural



Joist has completed one-half its travel and the reinforcing has been placed. It then returns under hopper for another layer of concrete on return through machine to the starting point

MOST LARGE MANUFACTURERS of concrete products depend on concrete building block for sales volume; with concrete joists, lintels, sills and other more specialized products in the role of side-line units. However, these "special products" are the principal production of the Formigli Architectural Stone Co., Philadelphia, Penn., and an impressive volume of sales has been built up in several lines.

Starting in business in 1914, the company until the past few years, was mainly a manufacturer of cast stone at its plant near Berlin, N. J. As the company grew, it diversified, and now manufactures six products that are of about equal importance, and each of which constitutes a successful business in itself. They are cast stone, Lith-I-bar reinforced concrete joists, precast white reflecting curbing for the New Jersey State Highway Department, channel roof slabs, Dunbrik and Mosai architectural concrete slabs. The last two are relatively new to the company, but markets are fast being developed for each of them.

Concentrate on Large Structures for Volume Sales of Joists

An impressive volume of concrete joist sales has been built up by concentrating on large building construction, in preference to the small residences. Large buildings, where joists are designed to meet the particular loading conditions according to *engineering* principles, have opened the door to large scale production.

Seven years ago, the company was licensed to manufacture the Lith-I-Bar I-beam section joist, and at first, the sales effort was centered on individual home construction. Then, in 1934, $25,000 worth of joists were sold for the construction of the Fifth Regiment Armory in Baltimore, Md. These were 8- and 10-in. depth exposed joists. Acceptance of the joists for this type of building, started the "ball rolling" for many other sizeable contracts, and the joist plant is now operated mostly in the fabrication of joists for major building projects.

Lith-I-bar joists are literally "pre-rolled structural concrete," with the concrete encasing a rigidly welded framework of reinforcing steel designed to standard factors of safety. Reinforcing consists of compression and tension rods, with diagonal tension members, or stirrups, arc-welded between the top and bottom bars to form a rigid frame or unit that cannot be dislocated or deformed when the concrete is rolled around it. Each joist reinforcing unit is designed with the proper stirrup reinforcing, according to the load to be carried, and therefore the joists are always manufactured to fit the job, without any cutting to length. Stirrups are set at a 45-deg. angle, which is at right angles to the direction of shear. This stirrup, arc welded between the two tension bars, so strongly anchors the bars in the concrete that tests have proved the steel can be stressed to its elastic limit before joist failure. This feature enables engineers to figure full value for the tension steel when Lith-I-Bar joists are used.

Formigli Architectural Stone Co. is licensed to manufacture and sell Lith-I-Bar joists by the W. E. Dunn Manufacturing Co. in eastern Pennsylvania, New Jersey and Delaware. A number of jobs have also been serviced in the District of Columbia. For live loads up to 120 lb. per sq. ft. of floor area, the Lith-I-Bar joist is considered the most economical system for fireproof floors in that part of the country. Under light floor loads these joists are laid in place for a total floor cost as low as 30c per sq. ft. of floor, and they have been granted official approval for class A construction in the city of Philadelphia.

This type of joist is machine rolled under pressure and is manufactured in depths from 6 to 14 in. and for spans up to 34 ft. in length. It has an

Appearance of joist as it returns from machine toward starting point of cycle, when it will be lifted off carriage and placed in curing racks

By BROR NORDBERG

Concrete

Formigli Architectural Stone Co. has unique production line method of manufacturing reinforced concrete joists in large volume. Also produces brick, slabs and curb

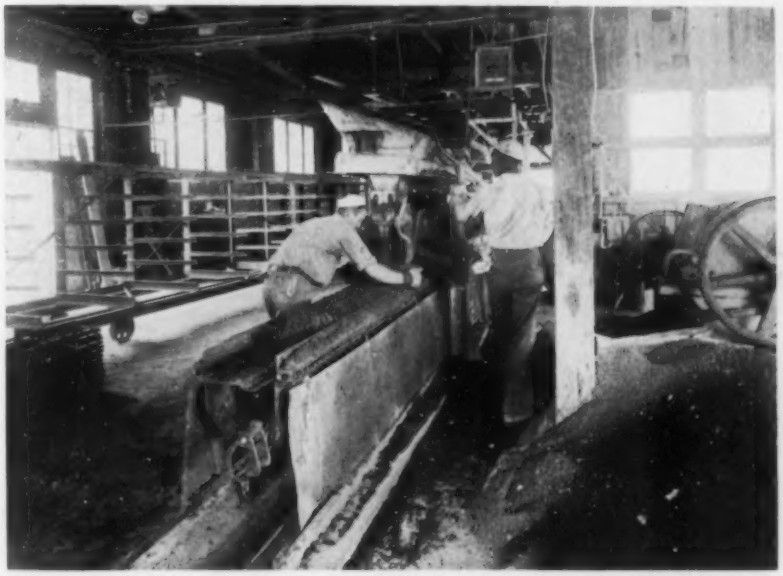
Stripping a freshly-made joist off carriage for placement on curing racks. Note lifters emerging from carriage to automatically raise the pallet into position for removal to racks where the joists are cured

Placing reinforcing in concrete. When this is done, carriage holding concrete travels to far end of building and remainder of concrete is laid down enroute from the hopper seen between the two men in background

I-beam cross-section, with widths from 2⅞- to 4½-in. and, when concrete slab is poured over the joists it results in a monolithic concrete floor. The Formigli plant has a separate building for joist production only, 25- x 120-ft. in dimensions, laid out for a large hourly capacity on a mass production plan.

Briefly, an oiled pallet is placed in a carriage, as illustrated, and a loose bed of concrete is laid down uniformly on the pallet between guide rails as the carriage travels under a concrete feed hopper toward the other end of the plant. When the carriage reaches the limit of its travel, the reinforcing steel unit is placed in the concrete bed in the carriage and the carriage slowly returns in the opposite direction. Additional concrete is fed out uniformly from the hopper and a series of rollers press the concrete to dimensions as the carriage returns to its first starting point.

The carriage is moved through the cycle by a motor-driven drum-wound cable, started and stopped by push button. After rolling, the joist emerges as a finished product and the pallet holding it automatically raises out of the carriage ready for transference to the curing racks by an overhead, hoist-operated off-bearing device. This particular plant is equipped with 215 30-ft. pallets and manufactures 1500 lineal feet of joists in eight hours.



Reinforcing has been placed and final layer of concrete is being poured into form. Note concrete hopper and rolls beyond to press concrete into final shape of joist. Concrete mixer is on right; curing racks to the left

When there is to be a run of joists, everything is prepared in advance for a minimum of delays in operation. Curing racks on wheels are placed in readiness near the off-bearer, the pallets are oiled and piled up in advance near the carriage and the reinforcing units are stacked up in a convenient pile near the "stop" position of the carriage at the other end of the building. Welders start one hour earlier to arc weld the stirrups to the tension and compression rods, on a special table, using 3/16-in. diameter welding rod and a Lincoln arc welder to do the work.

Aggregate is stockpiled near a 12-cu. ft. concrete mixer alongside the

Joist manufacturing plant, showing some finished products. Large stockpiles are not necessary in this plant

hopper which feeds concrete on to the joist carriage. All joists are manufactured, in the Formigli plant, from lightweight Haydite aggregate with about a 4½-gal. mix, producing a 4000 p.s.i. or better concrete at 28 days. The only curing necessary is done by keeping the joists damp while they remain on the curing racks, and shipments are made two days after the joists are rolled. High early strength portland cement is used only on rush orders, to prevent breakage in early handling.

Five men are needed to operate the joist plant; one at the mixer; a second at the concrete hopper over the joist carriage which is kept full by shoveling; a third at the motor control; and two others for stripping and placing the steel reinforcing.

Joists for Structural Tie Members

A new development by the Formigli Architectural Stone Co. is the adaptation of joists as structural tie members as well as load carrying members in large size buildings. Besides selling load-bearing joists, reinforced concrete members that tie into the steel frame of a building are now being merchandised. Appropriate tie flanges are welded to the standard reinforcing unit before making the joists, for bolting on to the structural steel in the building. Recently, a large apartment job in Washington, D. C., was won for concrete joists because the company was also able to furnish these structural tie members. Scarcity of lumber and steel is opening the way for more activity in this development.

Engineers Design All Large Jobs

A prominent firm of engineers in Philadelphia is engaged to assist in the design of all the large joist jobs, and to check the designs for some jobs which are made by the company. These engineers approve all designs where a licensed engineer's approval is required by the architect on the job. House jobs are not solicited, but some are sold through concrete block manufacturers. Precast concrete roof slabs are sold in connection with many joist jobs. These are of the conventional channel design, cast on vibrating tables, to a 2-ft. width, 1-in. web thickness, in lengths up to 10-ft.

Formigli and other licensees to manufacture Lith-I-Bar reinforced concrete joists contribute to the licensing company on a royalty basis, but this payment is largely spent for promotion, service and research in much the same manner as an Association operates. All the licensees cooperate in designs and merchandising to architects in their respective territories, which often results in a licensee landing a job which another licensee designed, handled and sold to the architect in this licensee's territory.

Some of the recent typical large construction jobs using this type of joist made by Formigli include buildings for Brewster Aircraft Co., New York Shipbuilding Co., Du Pont and other large industrial concerns.

A recent development of the company is the manufacture of Dunbrik which are made in various colors using integral mixes. An entirely separate plant has been built for this division, housing a Dunbrik machine, mixing equipment, curing kilns, and a tamped cast stone department. The brick manufacturing layout consists of a standard charging skip bucket, an overhead concrete mixer and the brick machine which has a production of about 1800 brick an hour.

Paul Formigli is president of the company and in charge of sales. Otto Formigli is secretary-treasurer and is in charge of production.

Court Sustains Block Company

FRANK ROBUSTELLO, operator of a concrete block plant at Rockville Centre, N. Y., on Long Beach Rd., has been upheld by the courts in an action by the village which sought to condemn the plant as a public nuisance. The court held that part of the property had been acquired by the block concern before it was incorporated into the village and the remainder had been utilized prior to the passage of a zoning law for the section.

Ready Mix Expansion for Ordnance Plant

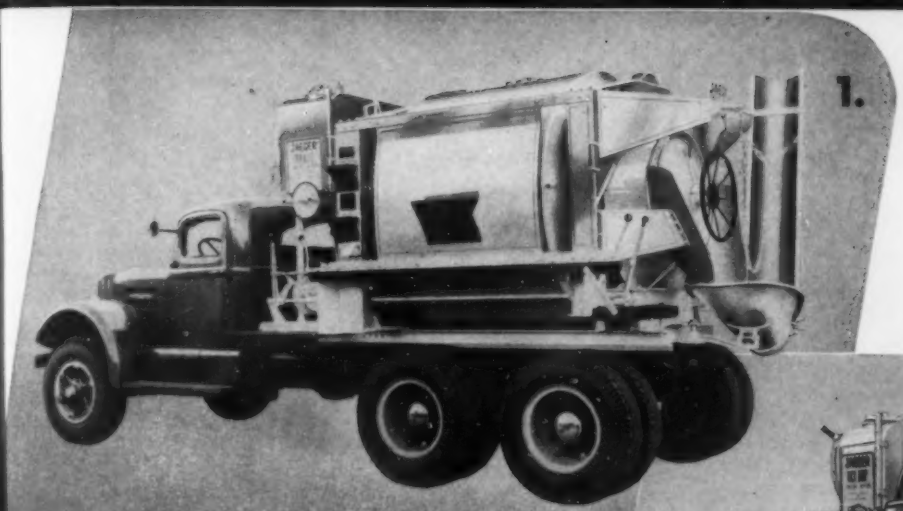
THE BIRMINGHAM SLAG CO., Birmingham, Ala., which now has two batching plants in operation to serve the Anniston ordnance depot, is constructing a third plant for use in the warehouse area. The Anniston project calls for the expenditure of $9,000,000.

Add Pipe Plant

WALLACE CONCRETE PIPE CO., Columbia, S. C., is expanding its business with the construction of a plant near Greenville.

Concrete bricks represent another fast-moving product made by this company

Only JAEGER Equips You to Meet EVERY Ready-Mix Demand

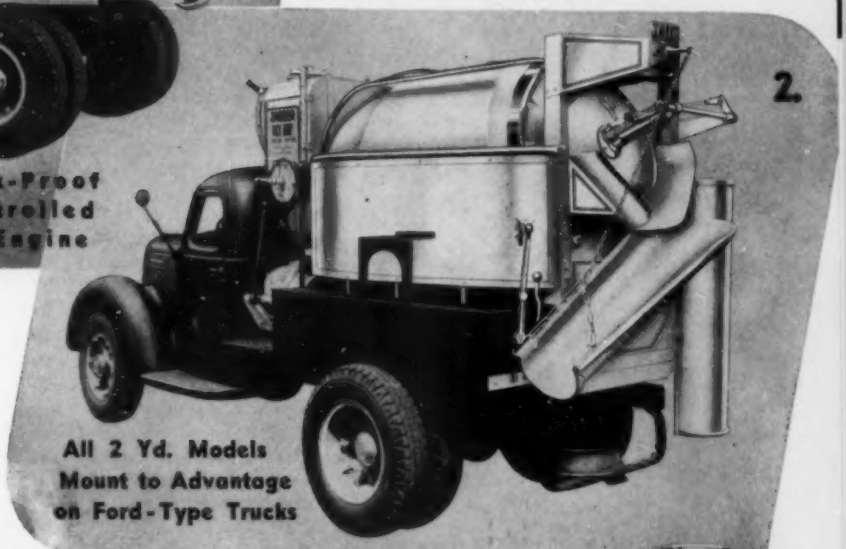


1.

All Jaegers Have 2-Speed Shock-Proof Transmission—Vacuum Cab Controlled Truck Engine Drive or Separate Engine

Standard LOW CHARGE

Type: Lowest, most economical to load; fastest on the market to mix and discharge — produce maximum daily yardage of proven higher strength concrete. Sealed drum meets any specification. Sizes 2 to 8 cu. yds.



2.

All 2 Yd. Models Mount to Advantage on Ford-Type Trucks

HIGH DUMP Types:

(2) Top Loading Models with "Sealed Drum"

(3) Or Combination Top and End Loaders (Pat'd)

Far outselling all other high discharge truck mixers today because they are fastest to load, mix and discharge any slump concrete — and are the only high discharge truck mixers that meet every specification and job condition.

"Sealed Drum" Models take full load in one quick drop through the top. Fast Vacuum-Controlled Discharge Door seals against loss of moisture and heat in winter concrete.

Jaeger End Loading Hopper Attachment (specially adapted to older or temporary plants not equipped for ribbon loading) offers many advantages over all other end loaders — and does not interfere with use of Top Loading Door where specified by engineers. (See details at right.)

Both types are built in 2, 3, 4 and 5 yd. sizes.

3.

Jaeger Charging-Discharging Hopper Attachment Permits Top or End Loading in Order to Meet Conditions - - -

The only end-loader which does not constrict drum opening and slow up charging and discharge. One quick turn of hand wheel opens Discharge Gate — no need to move entire Hopper (requiring many turns of a wheel) — no second seal to leak or wear.

JAEGER PORTABLE HOPPER

Saves Truck Mixers Waiting—Means 25% More Pay-loads per Day on Average Job. Tows to job behind truck mixer — takes full 2 or 3 yd. batches. One hopper serves almost any job.

JUST OFF PRESS-- VITAL FACTS FOR READY-MIX PLANTS

Complete 1941 Data, Models, Specifications, Prices, Terms

THE JAEGER MACHINE COMPANY
603 Dublin Avenue, Columbus, Ohio

Send us newest information on ☐ Standard LOW CHARGE Truck Mixers, Agitators, ☐ HIGH DUMP Models, ☐ Portable Hoppers, ☐ Auto-Pavers and Spreaders, ☐ Pumps, ☐ Mixers, ☐ Hoists, ☐ Carts.

Name_____

Address_____

Top to bottom: 1—Partial stockpile of tile in storeroom. 2—Cutting a colored tile with carborundum circular saw, also used to cut joists. 3—Making drain and sewer tile from 4- to 24-in. dia. 4—Cinder block being manufactured on hand machine fitted with vibrator

(Continued from page 61)

line and has had to increase its capacity to 700 sq. ft. of the large size in 10 hr. The company operates three vibrating tables, and produces 6- x 6-, 6- x 12-, 12- x 12- and 24- x 24-in. Stonex standard sizes.

At the same time, the company started manufacturing a precast I-beam section reinforced joist which is sold in connection with Stonex tile for 100 percent concrete floors, or separately. Joists are made, ten at a time, 8-in. in depth and up to 20-ft. lengths on a Kirk and Blum Manufacturing Co. vibrating table.

Merchandising Methods

Hoke Concrete Works had to compete with well-established clay products from the start but its volume of business has increased steadily. A full-time salesman, Mr. E. T. Noel, is on the road selling concrete block only, within the 75 mile operating radius, and the block are delivered by contract truckers. Concrete block carry the official certification of the Underwriters laboratory as a guarantee that they come up to standards for quality.

Mr. Upchurch created a lot of interest in concrete home construction and concrete units by building his own house of 100 percent precast concrete construction in a suburb of nearby Fayettville, N. C. This house had concrete joist floors, concrete masonry walls and cement-asbestos shingles, and was opened as a demonstration house. Radio and newspaper advertising brought 1200 people to inspect the house. These guests registered, and 12 other homes were sold directly traceable to the demonstration home, to start the ball rolling in concrete house construction.

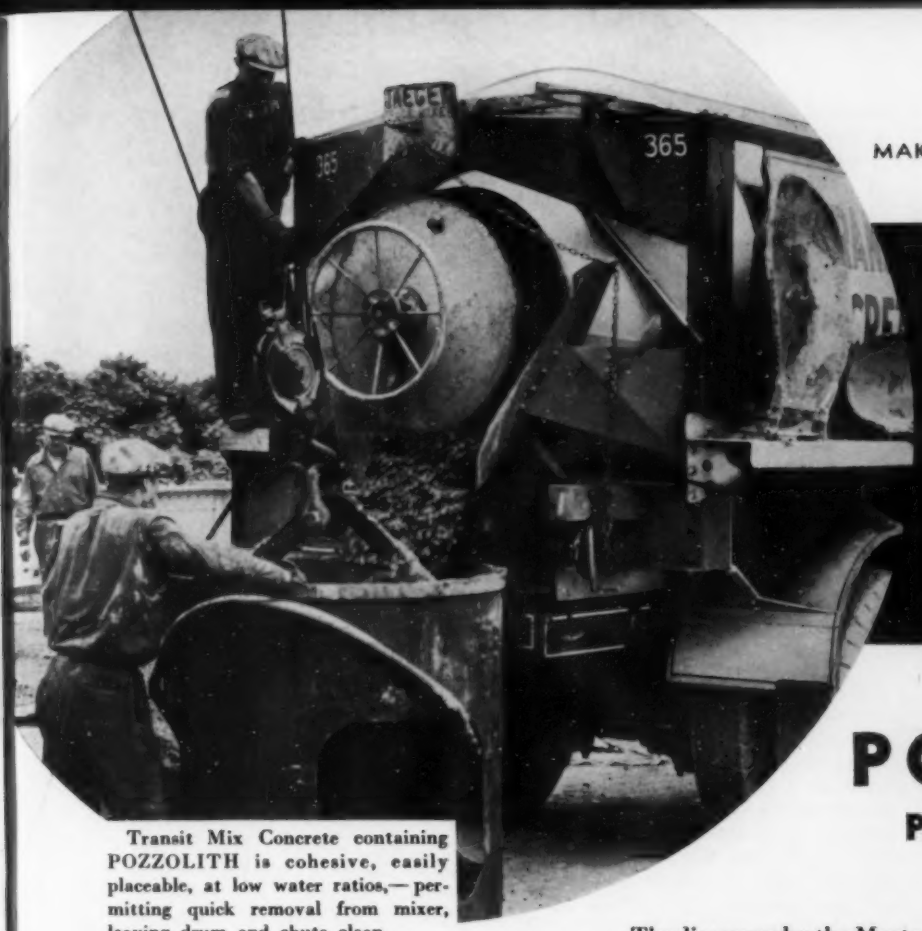
Stonex tile for floors, walls and wainscoting are sold by a definite plan and on a "delivered and placed" price basis. The sales policy is to get the key jobs for Stonex in various sections of the State and then sell more tile and joists through the tile installation men in the various communities. At the present time, six licensed tile setters are active in selling and installing these products. Production of Stonex was started in June, 1940, and sales are already taking the output of the three machines.

Among important "key" jobs that have been sold are one of the Pepsi-cola plants, for floors and wainscoting and the new Bane Hotel at Carolina Beach in which Stonex floors are used in the lobby, dining room and grill. Much of the sales volume is for store and theater fronts and for other business buildings.

Separate Units in Plant for Different Products

Separate departments in the plant are devoted to the manufacture of drain tile, Dunbrik and Dunstone, concrete block, concrete joists, and a special building is used for the manufacture of colored tile. Heavy concrete masonry units are made of local sand and gravel aggregates, and hard cinders from a stoker-fired steam-electric power generating plant are used for lightweight block. Cinders are crushed at the plant and the concrete units are cured by low

Making concrete brick on a high capacity machine. One leg of spout, above machine, is hinged so that it may be let down to provide concrete for block machine



Transit Mix Concrete containing POZZOLITH is cohesive, easily placeable, at low water ratios,— permitting quick removal from mixer, leaving drum and chute clean.

MAKES ALL THE CEMENT GO TO WORK

Cement DISPERSION

WITH POZZOLITH

PRODUCES MAXIMUM EFFICIENCY

The discovery by the Master Builders Research Laboratories in 1930 of a practicable cement dispersing agent and its incorporation in POZZOLITH made possible, for the first time, the application of dispersion *to all types* of hydraulic cement.

This outstanding technologic achievement, greatly increases the efficiency of all cement and, in effect, makes all of it "go to work".

Five advantages result:—

1. **Durability increased 50% or more.**
2. **High Early Strength — 20% or more increase in compressive strength at all ages.**
3. **Water reduction up to 20% — slump increased 150% or more for given water ratio.**
4. **Increased water-tightness — 20% or more reduction in absorption and permeability.**
5. **Reduced bleeding and segregation.**

WIDELY USED TODAY

Ten years' use of POZZOLITH by representative engineers, contractors and owners in many forms of concrete construction have proved its value and made its acceptance general.

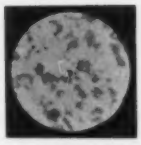
SPEED AND ECONOMY

On giant defense projects, on small and large industrial construction, POZZOLITH is being used because of its proved ability to produce better concrete with speed *while accomplishing important savings.*

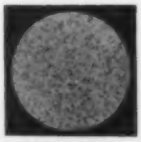
The complete story of Cement Dispersion and POZZOLITH will be sent on request. Ask for facts on how to make substantial savings through the use of POZZOLITH.

HOW POZZOLITH WORKS

Pozzolith contains Master Builders' cement dispersing agent. Cement particles in their normal state in water tend to gather together in bunches; i.e., flocculate. This bunching entraps water within the particle clumps. See microphotograph at right.



UNDISPERSED



DISPERSED

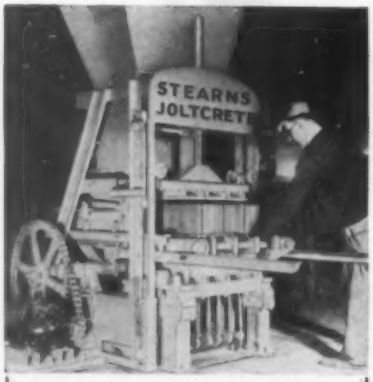
With Master Builders' dispersing agent these bunches are broken up into individual cement particles distributed throughout the water; i.e., dispersed or deflocculated. See microphotograph at left.

This dispersion makes the cement usable to its full efficiency; all the cement surface is made available for hydration and all the water for lubrication of the mix. (Water held within the particle clumps is released.) As a result of adding Pozzolith to cement mixes there occur the five advantages listed.

THE MASTER BUILDERS COMPANY

CLEVELAND, OHIO — TORONTO, CANADA

MASTER BUILDERS



"ANCHOR"

Complete

EQUIPMENT AND ENGINEERING SERVICE

Equipment for all phases of manufacturing concrete cinder block and other lightweight aggregate units. Our engineering service for new plants and modernizing old ones will help you operate more economically.

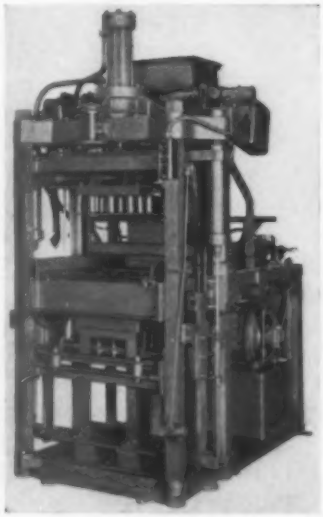
Hobbs block machines, Anchor tampers, Anchor Jr. strippers, Stearns power strippers, Stearns Joltcrete, Stearns mixers, pallets, Straublox Oscillating attachments, etc.

Repair parts for Anchor, Ideal, Universal, Stearns, Blystone mixers and others.

Anchor Concrete Mchy. Co.

G. M. Friel, Mgr., COLUMBUS, OHIO

HYDRAULIC VIBRA-PRESS



A High Production Machine Making Blocks which are Demanded by the Contractor Endorsed by the Architect Desired by the Mason

The KENT MACHINE CO.

CUYAHOGA FALLS, OHIO

pressure steam in summer as well as winter. Concrete block are manufactured to develop compressive strengths of 1000 p.s.i. to 1200 p.s.i. gross area, in 18 days.

Color Oxides and Cement Ground Together

Stonex tile are manufactured according to standards developed by the parent company in Miami. Colors and blends of colors for facing the tile are made by mixing the appropriate mineral oxides with the portland cement (white or grey depending upon the color desired), fine aggregate and water which are mixed for a facing concrete. In this plant, Mr. Upchurch has installed a small ball mill to regrind the oxides and portland cement together to guarantee thorough mixing. Uniform mixing of the proper portions of cement and oxides prevents color fading and separation.

A facing of $\frac{3}{8}$-in. or more of the colored concrete is vibrated into place in special steel molds on the vibrating tables and, after a lapse of about an hour, a backing of grey concrete is applied in the same way to the proper thicknesses. Twenty-four inch square tile, 2-in. thick, are reinforced with wire mesh, since they are load-bearing when placed as a floor. Smaller tile are $\frac{1}{2}$- or $\frac{3}{4}$-in. thick, without reinforcement, and have many applications where colors are wanted.

Molds are stripped two days after manufacture on a special machine which "springs" the sides of the mold to release the units. Kirk and Blum Manufacturing Co. manufactured the high frequency electric vibrating tables and the stripping machine.

Concrete for joists and tile backing is mixed in a 10 S Jaeger mixer, and delivered to the point of use, by wheelbarrows. The joist table is set below the main plant level, which makes it a simple process to dump the concrete into the gang molds on the joist table. Lintels of heavy aggregates, or cinders, are manufactured on the joist machine. Ordinarily, joists are manufactured to fit the job, but the plant is equipped with a circular carborundum power saw for cutting joists, as well as other products, to exact dimension. Concrete brick are manufactured on a standard Dunbrick machine with a 12-cu. ft. skip-charged concrete mixer. E. E. Smith is superintendent of the plant; Archie Howard is bookkeeper.

Big Pipe Order

Shelton Concrete Products Co., Shelton, Wash., has an order for 15,000 lin. ft. of concrete pipe to be delivered to Bremerton Navy Yard. Another order for 5400 lin. ft. to be used in a sewer system at Fort Lewis is now going through the plant. The plant is so busy that the manufacture of some products has been discontinued, according to Clarence Grunert, manager.

Concrete and Bituminous Mix Plant

The Newport Paving & Supply Co., Inc., Newport, Dela., has started up two new plants near each other, one for the production of "amiesite" and the other for batching concrete. The bituminous mix plant will have a capacity of 60 tons per hour, and the concrete batching plant will produce a similar amount per hour. Eleven new trucks have been purchased, five of which are transit mixer trucks. The total investment is about $100,000.

Form New Concern

Concrete Conduit Co., Ltd., south of Colton, Calif., has been dissolved as a corporation and will be continued as a limited partnership with Joseph G. Prosser and Thomas W. Prosser named as "limited partners." Elmer L. Johnson, formerly vice-president and general manager will be the "general partner." The name of the company will be the Concrete Conduit Co.

Concrete Ships

A campaign to revive government interest in concrete shipbuilding has been started by members of the original Newport Shipbuilding Co., which built 19 of these craft during World War I. It has been pointed out to American and British representatives that ships up to 5000 tons could be built with half the usual steel requirement by the use of concrete.

New Concrete Tile Concern

The Hollostone Tile Co., Las Vegas, Nev., is adding another concrete block machine, according to A. C. Grant, president of the company. In addition to concrete products, the company plans to furnish ready mixed concrete.

New Ready Mix Concerns

Samson Block Co., Lorain, Ohio, is planning to enter the ready mixed concrete business, and will also make concrete brick.

•

Frank Casilio, Bethlehem, Penn., has recently purchased a new 3-cu. yd. Ransome high-dump transit mix unit mounted on a Mack EH chassis.

DOMINATE *The Complete* FIELD

You can dominate the vast building material market in your territory. You are already producing 80 to 90% of the raw materials needed. 10 to 20% is cement, which is available everywhere. Then, with Dunn equipment you can produce practically all the materials needed for permanent, fire-safe construction.

The builders in your community today are handicapped with numerous shortages, delays and rapidly rising prices. Help solve their problem and at the same time improve and short-cut their construction methods by manufacturing these products.

Here are two outstanding products that offer you this great opportunity.

LITH-I-BAR Joists—comprising an improved, low-cost floor system, that reaches an immense new market. Present manufacturers already established are furnishing many miles of this product for various public, industrial and residential construction.

LITH-I-BAR floor system eliminates tons of structural steel, long delays, and high cost. It is patented and made by exclusive machinery. Help the National Defense Program and make possible the continuance of such construction, including hotels, apartments, schools, hospitals, etc., that could not proceed otherwise.

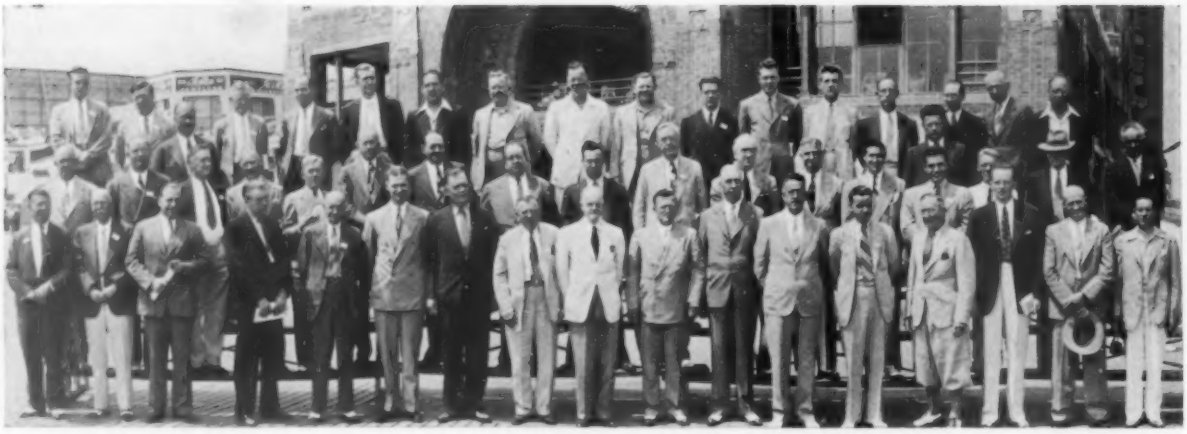
DUNBRIK-DUNSTONE—Learn about this better single and multiple brick. The multiple unit cuts construction costs to the level of frame. Millions of units in daily use. With your own aggregate, you can make it in complete range of colors, shades and textures. With Dunn low-cost, line production equipment, you will be able to sell your aggregate in the form of DUNBRIK and DUNSTONE up to $12.00 per ton.

Scores of present manufacturers are dominating their field and at the same time building sound and successful business enterprises of their own. DUNBRIK and DUNSTONE beauty, quality and low production cost will enable you, too, to meet any competitive condition.

Either LITH-I-BAR or DUNBRIK-DUNSTONE have all the essentials of stable, profitable businesses. Trademarked products—nationally publicized—protected territory—lowest manufacturing costs, are your assurance of a successful business and profitable operation.

You owe it to yourself and to the building industry to investigate now. Learn how you can dominate the building material market in your territory by becoming a manufacturer of these outstanding products. Write or wire for free books. They tell the complete story. No obligation.

23 W. 24th St. **W. E. DUNN MFG. CO.** Holland, Mich.



Members and guests of the National Cinder Concrete Products Association on the famous board walk at Atlantic City, N. J.

Cinder Block Convention

Industry reports defense business keeps plants operating three shifts per day. Hold marketing and manufacturing "clinics"

ATLANTIC CITY, N. J., was again the Mecca of business and pleasure which drew the 18th Annual Convention of the National Cinder Concrete Products Association held on August 4, 5 and 6 at the Traymore Hotel.

As most cinder concrete masonry plants are running two or three shifts to keep pace with defense construction demands, the attendance was not as large as in other years. Eighty-two were registered at the Convention. The theme of the 3-day meeting was, "How can the industry further the defense program and the growing importance of the small house market to the future of the industry?"

GEORGE W. GOELITZER of Kansas City, Mo., president of the Association, opened the convention with the review of the past year. He stated that never before was the industry better equipped to take care of the unprecedented requirements for defense construction. The production during the past year has been the largest in the history of the Association. He also stated that he was particularly gratified with the support the industry had given the Association activities during his term of office.

CLOYD B. FELLABAUM, Toledo, Ohio, was elected the new president of the Association. Mr. Goelitzer became chairman of the board and the two new directors elected were Dean R. Lynde of Denver, Colo., and Earl Smith of Richmond, Va. Six members of the board reelected were Herbert J. Vincent, Detroit, Mich.; S. Paturzo, Baltimore, Md.; A. C. McGuire, Rochester, N. Y.; Herbert A. Davis, Arlington, Va., and Harry H. Longenecker, the latter also being reelected as secretary and treasurer.

Marketing Clinic

Two sessions in the marketing clinic were held under the able direction of Clifford C. James, Director of Business and Marketing Clinics, University of Baltimore. In the first session papers discussing the new marketing developments in the building industry were presented by Louis Brookman, Jr., publisher of *Concrete*, Chicago, Ill., Paul M. Woodworth, P.C.A., Chicago, and Frank B. McKenna, Lehigh Portland Cement Co., Allentown, Penn.

An interesting discussion regarding the relationship of Cind-R-Block and the architect was participated in by Thomas J. Earley, architect, Philadelphia, Penn.; Charles W. Akers, Nashville, Tenn., and Herbert J. Vincent of Detroit, Mich.

In discussing the theme of the future of small homes and developments, Howard S. Davidson, Better Homes and Gardens, Des Moines, Iowa, featured in his talk a home of Alden C. McGuire of Comoc Building Supply Co., Rochester, N. Y., Association Director for 1942. David Scribner of Eastern Housing Corp., and Leo A. Kirk, Federal Housing Administration, Philadelphia, Penn., discussed other features of this program. In the second session Dean R. Lynde, E. M. Prettyman and Samuel Paturzo discussed in detail the use of Cind-R-Bloc in the national defense program.

Information on cost facts and competitive selling was presented by William R. Ginder, C.P.A. of Philadelphia, Charles P. Lower of Bethayres, Penn., A. C. McGuire of Rochester, N. Y., Fred Reinhold, Buffalo, N. Y., and Claude Harrison, Jr. of the advertising agency, Hauck and Company, Richmond, Virginia, discussed analysis of sales methods and advertising helps used in the industry. In discussing the subject of creating public acceptance for Cind-R-Bloc, Charles W. Akers, Francis J. Straub and R. Loran Langsdale presented their views and led the discussion.

The Tuesday morning session was devoted to discussion of relation of building officials and products manufacturers by Charles A. Flanagan, Chief, Bureau of Building Inspection, Philadelphia, Penn., and an extensive discussion of the Federal Works Program by N. Max Dunning of the Federal Works Agency, Washington, D. C.

Leo A. Kirk, Philadelphia, Penn., and Richard Quay of the legal staff, Federal Housing Administration, Washington, D. C., discussed in detail the relation of the FHA program to defense housing.

Sorry—

We'd like to show you how Butler builds for Defense but . . .

CENSORED

photographs are "out" for the duration.

We'd like you to see the plant that will turn out concrete faster than it has ever been poured before on dry dock construction. We'd like to show you the Butler plants working on every phase of the national defense program—air bases, ordnance depots, cantonments, factories, TNT plants, naval supply depots.

And we'd like you to know that on every drydock project east of the Rocky Mountains, Butler plants furnish the concrete at unprecedented speeds. At Charleston, Portsmouth, Philadelphia, Bayonne, Brooklyn, and Boston, the Navy has turned to Butler equipment.

Whether you need a central mixing plant for a monster dam, or whether you are interested in a small bulk cement plant, consult Butler engineers. It pays to have the best.

Write to—

BUTLER BIN CO.

WAUKESHA, WISCONSIN

QUINN PIPE FORMS

HEAVY DUTY PIPE FORMS

Our Heavy Duty type with Adjustable Locks is shown above. Quinn Heavy Duty Forms are also available with a new wedge-type lock.

HAND or WET PROCESS

Make concrete pipe on the job with Quinn Pipe Forms. They can be handled by less experienced labor and produce uniform concrete pipe of highest quality. Quinn Pipe Forms make pipe conforming to A. S. T. M. requirements as to wall thickness and other standards.

Quinn Heavy Duty Pipe Forms are built to give more years of service—sizes for any diameter pipe from 12 to 84 inches—tongue and groove or bell end pipe—any length. Backed by over 30 years of service in the hands of contractors, municipal departments and pipe manufacturers.

MEDIUM DUTY PIPE FORMS

Meet the demand for low cost equipment that produces a uniform quality of pipe in smaller amounts. For making pipe 12 to 60 inches in diameter—any length.

WRITE TODAY

Get complete information on prices and Special Construction Features of Quinn Pipe Forms. Give us size of job for estimate on your pipe form needs.

Also manufacturers of Quinn Concrete Pipe Machines for making pipe by machine process.

QUINN WIRE & IRON WORKS 12TH ST. BOONE, IA.

"NO KID GLOVE HANDLING"

Commercial Steel Pallets can be dropped, walked on, stored in wet places, stored in dry places, and nothing happens.

Treat any other kinds of pallets that way and see the results.

Commercial Prestee! Pallets need no kid glove handling in order to keep them in perfect shape for use at any and all times, and besides that they fit the core box; no filing, no grinding, no planing or sawing. When they reach you from our Plant they are ready to go right into the machine. Why waste time and money on other types?

Write for our little folder, "Here's the Dope"

The COMMERCIAL SHEARING & STAMPING COMPANY

YOUNGSTOWN, OHIO.

For Hi-Quality Blocks At Remarkably Low Cost

There's Nothing Like
PAK-CRETE
Combines VIBRATION and PACKING
Details Provided—No Obligation
Write
KRAMER PRODUCTS CO.
INDUSTRIAL ST. PEORIA, ILL.

Thomas S. Holden, president, F. W. Dodge Corporation, New York, N. Y., presented a very timely paper of extreme interest to those attending the Convention on "What Is the Future of American Business and Its Relation to the Building Industry."

Manufacturing Clinic

The Wednesday morning session was a manufacturing clinic with H. A. Davis, chairman, Research Committee in the chair. The improvements and developments for the manufacture of Cind-R-Bloc were discussed in detail by A. B. Babbitt, president of the Kent Machine Company, Cuyahoga Falls, Ohio; Eugene F. Olsen, president, Stearns Manufacturing Co., Adrian, Mich.; and Haakon Paulson, general sales manager, Besser Manufacturing Co., Alpena, Mich.

Cement Shortage?

IT IS REPORTED from Ogden, Utah, that a contractor having a large road and sidewalk job at Utah general depot, U. S. Army, could not get delivery on cement until next Spring and refused to carry out his contract. Local interests are urging the use of rock asphalt which is mined in Carbon and Uintah counties, Utah. There is some agitation among state officials to increase the manufacturing capacity for cement in the State.

Housing Project Calls for 50,000 Ft. of Pipe

BREMERTON CONCRETE PRODUCTS CO., Bremerton, Wash., has a contract to supply 50,000 ft. of concrete sewer pipe in sizes ranging from 4-in. to 18-in. diameter for the Westpark defense housing project. A sand and gravel plant at 14th and Sheldon boulevard has been acquired by the concrete products company. Ready mixed concrete also is being furnished for the project.

Moving Pipe Machinery to Jamaica

THE UNDERGROUND PIPE CORPORATION, Decatur, Ill., which operates a concrete pipe plant at La Grange, Mo., has been awarded a contract to make pipe for the United States government for an air base being constructed at Kingston, Jamaica, one of the island outposts secured from the British. G. S. Chastain, president, said that part of the machinery would be moved from the local plant to the island. Melvin Tuetkin, superintendent of the plant, and two other employes will go to Jamaica. The pipe contract amounts to about $100,000.

FIVE DAYS FREE TRIAL IN YOUR PLANT

Cuts Any Size or Shape
CLAY
SILICA
CHROME
MAGNESITE
SILLMANITE

Maximum Safety to Operator

The Clipper MASONRY SAW
for
SPEEDY, ECONOMICAL REFRACTORY CUTTING

Model H Designed for Industry

The **CLIPPER MFG. CO.**
ST. LOUIS, MO.

SAVES TIME • SAVES LABOR • PORTABLE
TIGHTER JOINTS • GREATER SALVAGE

SURE CONCRETE BRICK CAN BE MADE WITHOUT PALLETS ON THE
JACKSON CONCRETE BRICK MACHINE

Just Think What This Means in Dollars and cents saved in handling and upkeep as well as the cost of the pallets themselves.

Investigate today the most efficient and up to date concrete brick making equipment on the market.

JACKSON & CHURCH CO.
SAGINAW, MICH.

CONCRETE PRODUCTS
Consultation Service

In these pages, month after month, is published the most helpful information obtainable about the manufacture and sale of all kinds of concrete products. If you need further details about any of this material or about concrete products equipment our staff of engineer-editors will be glad to serve you. Producers everywhere are taking advantage of this extra service. Write us about your problems.

ROCK PRODUCTS
309 West Jackson Blvd. Chicago, Ill.

NEW MACHINERY * NEW EQUIPMENT

Fast Operating Crane On Pneumatic Tires

THE OSGOOD CO., Marion, Ohio, has announced an improved Model 705 WM. Mobilcrane which is operated by one man and one motor, and includes as features: air-control of all move-

Swing, travel, and hoisting mechanisms of this crane are air-controlled

ments, an independent boom hoist, independent travel and swing motions, and hook rollers.

A three-point suspension is used in the truck frame, which largely eliminates twist and strain when traveling over rough surfaces. When lifting, the front axle is provided with leveling jacks to keep the upper body on an even keel. The upper body is kept on the revolving base through the use of hook rollers.

The gear-driven transmission provides four speeds, ranging from ¾ to 5 miles per hour. A heavy roller chain transmits the power from the differential to the tandem rear wheels, all driven, which are mounted as a unit, and oscillate when traveling over rough, uneven ground.

Up and down movement of the front axle is permitted by supporting it in a pintle. Steering is accomplished by slewing the front axle with a hydraulic cylinder, operated by the operator from the cable.

Compressor Selector

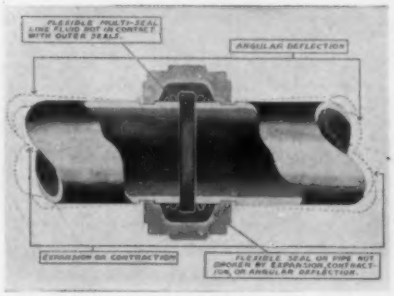
QUINCY COMPRESSOR CO., Quincy, Ill., is distributing what has been termed a Compressor Selector which functions like a slide rule. One setting of the scale shows correct compressor model number, free air delivery, r.p.m., piston displacement and motor horsepower required. The Selector also contains figures for making allowances for loss in free air delivery at high altitudes. It is said to be accurate for both air and water cooled compressor applications requiring up to 80 cu. ft. displacement. Pressures covered by the Compressor Selector range from 30 to 250 lb.

Flexible Pipe Coupling

THE DILLON CO., Tulsa, Okla., has developed a flexible pipe joint which is adaptable for pipes carrying oil, gas, or water and also those subjected to air pressure or vacuum.

It consists of a housing made in two parts and bolted together and a rubber multi-seal ring that fits over the ends of the pipe and is held in place by the housing. The housing fits into the standard groove of the pipe. With the multi-seal rubber ring there are three points of contact on each side of the pipe joint which is said to make the joint leak-proof. This type of joint permits normal contraction and expansion of the pipe line and also angular deflection of over five degrees from a straight line.

Old pipe can be reclaimed by cutting off the threaded ends and grooving it. It is said that even pipe



Pipe joint which provides for angular deflection

that is pitted can be used for with the multi-seal principle it is possible to make a joint effectively and prevent the fluid or gas in the line from leaking around the pits.

Rubber rings used in these couplings resist oil, gasoline and acids. The tapered bolt holds in the lug, makes the joint housing self-aligning and supports the body in the center as well as at each end.

All-Welded Convertible Shovel-Dragline-Crane

LINK-BELT SPEEDER CORP., Chicago, Ill., has brought out a light-weight ¾-cu. yd. convertible shovel, Model 75. All-welded steel construction has replaced castings, and the power plant is a heavy-duty gasoline or Diesel engine with a roller-chain drive.

External band clutches enable the operator to "feel" the load at all times. This sensitivity, plus external band brakes operated by automotive type pedals, is said to result in accurate control of the load and in its placement. A large diameter turntable and long, wide crawlers give this model stability on slopes and in heavy digging.

Controls operated from within the cab permit steering in both direc-

Light-weight, convertible ¾-cu. yd. shovel has crawler shoes with double-faced track rollers

tions, either gradual or sharp, regardless of the relative position of cab and lower base. A positive traction lock, controlled from the cab and engaging in three positions, prevents movement of the crawlers while working, eliminating any necessity for chocks or blocking.

Hose for Fumes and Abrasive Dust

THE B. F. GOODRICH CO., Akron, Ohio, has announced a new line of hose for conducting fumes and abrasive dust. It is light and flexible, and is made with a smooth rubber type, helical wire reinforcement, plies of fabric and corrugated rubber cover. The ends are built for three inches back without wire to facilitate fittings. The hose is manufactured in sizes ranging from 2 to 12 in. in diameter, in 8-, 15- and 25-ft. lengths.

Vertical Turbine Pump Eliminates Losses

THE POMONA PUMP CO., St. Louis, Mo., and Pomona, Calif., has been granted patents covering design improvements which are said to eliminate hydraulic losses in pumps. These improvements involve fundamental design changes in the guide vanes, function of which is to alter, from horizontal to vertical, the flow direction of fluids being pumped.

It was discovered by Pomona engineers that, because fluid being discharged by the impeller element flows across the guide vanes at various

Vertical pump equipped with new type guide vanes. Left: Shows bulbous shaped end of guide vane. Inset: Cross-section of bowl assembly, arrows indicating guide vanes

angles (instead of always directly across the advance edge), eddy friction losses are encountered, reducing the efficiency of the pump.

By forming these advanced vane ends of a bulbous shape, it was discovered that regardless of the flow direction of the fluid, its direction would always be substantially tangential to the vane surface. Thus, greater uniformity of flow pattern is secured, friction is reduced and efficiency of fluid lift is increased. Due to the recessive curve at the rear of the bulb-shaped vane, eddy currents are not developed as under former circumstances.

Large Crusher Casting

FARREL-BIRMINGHAM CO., INC., Ansonia, Conn., recently poured a 68-ton Meehanite casting which forms the bed of a stone crusher capable of reducing 4- x 4- x 5-ft. pieces of rock to crushed stone. It was made for Earle C. Bacon, Inc., New York, N. Y., and installed at the quarry of the Kingston Trap Rock Co., Kingston, N. J.

As it was necessary to machine this casting at the quarry, easy machineability, high strength, and wear resistance in service were desirable qualities found in Meehanite, the metal used. Only ten minutes were

Crusher casting machined at the quarry

required to pour the casting, but it was allowed to cool in the sand for two weeks and another week was required to shake it out and clean it.

Light-weight Dragline Buckets

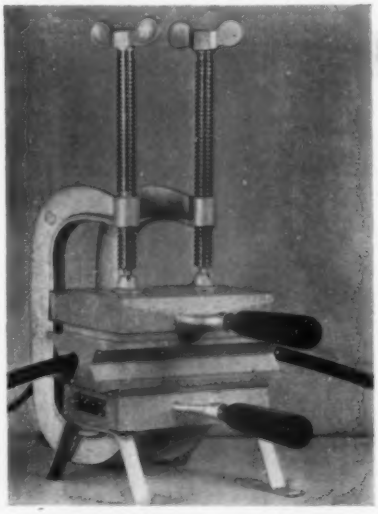
THE DE SOTO FOUNDRY, INC., Mansfield, La., has designed three types of light-weight bucket which have some interesting features.

All-welded construction is used in the three types, LS, TS, and HS, and the teeth have reversible manganese points. As shown in the illustration, the buckets are made with perforated round holes to reduce weight but the bottom is not perforated. The buckets have a one-piece hitch plate and trunnion which distributes strain of pull and hoist over the entire length of the bucket. Manganese steel chains and fittings are standard equipment.

All three types of the Hendrix bucket range in size from ⅜ to 4-cu. yd. capacity. The LS is a light weight bucket designed for levee and drainage work; type TS is said to be particularly adaptable for handling gravel, hard clay, etc.; and the type HS is a heavy bucket suitable for rock excavation work.

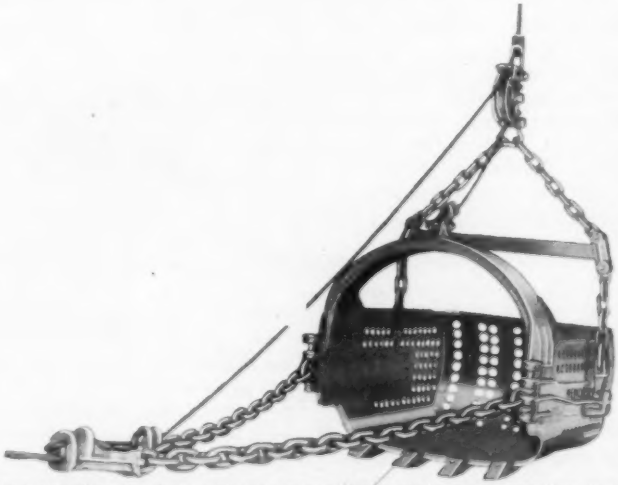
Cable and Belt Vulcanizer

THE SHALER CO., Waupun, Wis., has brought out an improved line of cable and belt vulcanizers. In the illustration is shown the model developed for the repair of rubber covered electrical cables where cables are spliced or where insulation has become damaged. Interchangeable mold blocks to



Cable vulcanizer equipped with various size mold blocks for different cables

accommodate various size cables are provided. Other models are made for splicing round or flat rubber belts, all being electrically heated and furnished with appropriate attaching cord and plug for connection on ordinary 110-120 volt circuits.



All-welded dragline bucket with one-piece hitch plate and trunnion to distribute strain over entire length of bucket

Permanente Cement Plant Enlarged Again

PERMANENTE CORP., with plant near San José, Calif., is adding a fourth big rotary kiln to its portland cement manufacturing facilities; also additional grinding machinery. This will give the plant an approximate capacity of around 16,000 bbl. per day, making it the largest single unit in the industry. The new kiln may also be used in the magnesium plant now under construction on the cement plant site.

Kyanite Mines Resume

MUNN AND STEEL, INC., Newark, N. J., vermiculite producers and specialists, in association with the former owners and operators of the Celo kynate mines, Burnsville, N. C., have acquired all the assets of Celo Mines, Inc., under the corporate title Mas-Celo Mines, Inc.

Vernon L. Mattson, former manager of Celo Mines, Inc., will continue in charge of operations at Burnsville, while sales and executive offices are merged with the offices of Munn and Steele, Inc., 130 Lister Ave., Newark. Mining operations have been resumed, to produce kyanite, mullite, abrasive sand, mica, silica, garnet and other allied products.

Reopen Cement Plant in California

PACIFIC PORTLAND CEMENT CO., San Francisco, Calif., has resumed production at its San Juan Bautista plant near San Juan after 11 years. The plant was re-opened on an emergency basis, for defense construction, and will be in permanent operation only if normal business volume will justify it. New equipment added thus far includes a power shovel and trucks that replace a railroad system of haulage from the quarry to the plant. The plant was operated as the Old Mission Portland Cement Co. until it was purchased by the present owner after it closed in 1930.

Riverside Expands Cement Plant

RIVERSIDE CEMENT CO., Los Angeles, Calif., is removing two kilns and a 7- x 26-ft. grinding mill from its plant at Oro Grande, Calif., to its Riverside plant which is being expanded. The Oro Grande plant has not operated since 1929.

To Build Concrete Boats

OLYMPIA SHIP CO., INC., is the name of a new company which has been organized to build concrete ships at Olympia, Wash. Incorporators are L. M. Hampton, P. O. Dovey, and E. N. Eisenhower, all of Tacoma, Wash. E. O. Fitzpatrick, vice-president of the company, is negotiating with the Maritime Commission for an order for 100 concrete barges.

Lime Firm Expands

LYDA LIME CO., Blacklick, Penn., has invested $5000 in new machinery to meet increasing demands for their products. New equipment includes a 98-hp. Caterpillar Diesel engine, a Jeffrey pulverizer, and a Holland burr machine, according to W. J. Lyda, president of the company.

Privately-Owned Cement Plant for Puerto Rico

PONCE CEMENT CORP., Puerto Rico, is building a new wet process cement plant near the city of Ponce that will have an ultimate daily capacity of 3000 bbl. The major production machinery was purchased from American manufacturers as a result of a six weeks' trip to the United States made by two of the company's officers.

The kiln for the first unit was manufactured by the Traylor Engineering and Manufacturing Co., and General Refractories Co. is making the kiln lining. F. L. Smidth & Co. is furnishing the grinding equipment and the kiln control and firing equipment; Allis-Chalmers Manufacturing Co. will furnish the wash mill and all the electric motors; a Pennsylvania hammer mill will be used in the crushing plant with a Harnischfeger traveling crane for handling in storage; there will be a Fuller air quenching clinker cooler, a Fuller-Kinyon transport system for cement and cement will be packed in paper bags by a Modern packing machine.

McDonald Engineering Co. has the contract to design the cement storage silos and the structural steel buildings are being fabricated by the American Bridge Co.

The company has 1000 acres of mineral deposits from which silica, limestone, gypsum and clay will be obtainable, near the site of the plant. Oil imported from the United States and South America will be the fuel used and electric power will be obtained from the Power Authority of Puerto Rico.

The plant is being designed and built by the Porto Rico Iron Works, Inc., of Ponce, Puerto Rico, with A. P. Hachtman of Allentown, Penn., as consulting engineer. Officers of the company are Antonio Ferré, president; J. Adalberto Roig, vice-president; Luis A. Ferré, treasurer; José A. Ferré, secretary; and A. Agripino Roig is a director.

Idaho Phosphate

TETON PHOSPHATE CO., INC., Boise, Idaho, has announced plans to begin development operations in its phosphate operations about October 1. The company owns extensive holdings of rock phosphate near Montpelier that is described as the only open face location in the world where phosphate can be removed with a power shovel. Houston T. Hitt, former Idaho state land agent, is president of the company.

Seek Quarry Rights

W. E. CALLAHAN CONSTRUCTION CO., and Gunther & Shirley Co., Los Angeles, Calif., have requested authority to operate a quarry and crushed stone plant in the vicinity of Malibu Creek about 1½ miles north of the Coast highway, Route 101, in Los Angeles county.

Buy Equipment

THE J. & L. SNOUFFER, INC., crushed stone plant at Dublin, Ohio, is being expanded to increase agricultural limestone production. Among other improvements, a new vibrating screen is being installed. Irven Horch is in charge of the agricultural lime department.

Electrify Silica Plant

EVERTON SILICA SAND CO., Everton, Ark., has completely electrified its plant, having recently completed connections with power lines of the Arkansas Power and Light Co. Both steam and Diesel power were replaced with electric motor units.

National Safety Congress

NATIONAL SAFETY CONGRESS will hold its sessions and exposition in Chicago at the Stevens hotel the week of October 6-10. As usual, the Cement and Quarry Section will hold special meetings on the hazards, and the safety programs of particular interest to operators of quarries and mills.

FINANCIAL NOTES

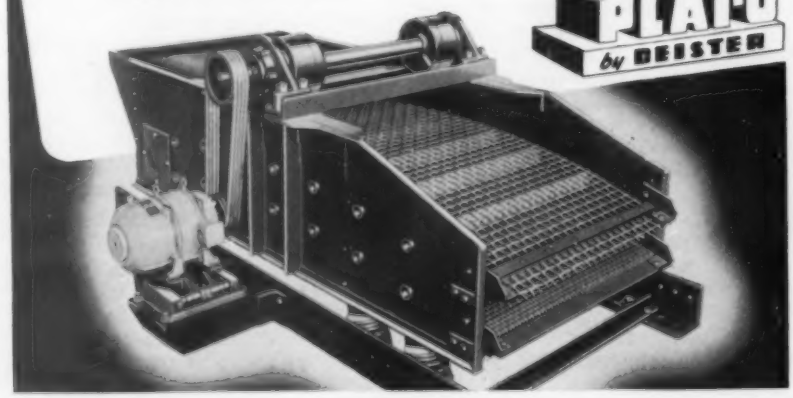
RECENT DIVIDENDS ANNOUNCED

Alpha Portland Cem. Co.	$ .25	Sept. 25
Basic Refractories	.20	Sept. 10
Bessemer Lim. & Cem. Co., pfd. (arrears)	1.50	Aug. 15
Canada Cem. Co. Ltd. 6½% pfd. (arrears)	1.25	Sept. 20
Consolidated Cem. Corp. Cl. A (np) a 0.73 (arrears)	1.40	Sept. 15
Dolese & Shepard	1.00	Aug. 30
National Gypsum, pfd.	1.12½	Sept. 2
Southern Phosphate	.15	Sept. 30
Lawrence Portland Cement Co.	.25	Aug. 15
Eastern Magnesia Talc. Co. (p100)	1.00	June 30
Pacific Portland Cem. Co. 6½% pfd.	1.00	July 29
Ohio River Sand Co. 7% pfd. (p100)	1.00	Sept. 1

BETTER THAN 10,000 WORDS

Like a picture, one *repeat* order is worth 10,000 words when it comes to describing the consistently high standard of performance demonstrated by Deister PLAT-O Vibrating Screens in all types of screening operations. Today, 41% of PLAT-O sales are *repeat* orders . . . orders from *satisfied* customers . . . customers who— once accustomed to PLAT-O's fast, accurate and economical grading—are never again content with anything less than PLAT-O. PLAT-O gives you all the features of design and construction that assure increased tonnage at a lower cost per ton . . . powerful, positive vibrating mechanism —actual automatic screen cloth tension—oil lubrication—fully cushioned vibration—maximum dependability and minimum maintenance costs. These are just a few of PLAT-O's outstanding advantages . . . write today for complete information.

DEISTER MACHINE COMPANY • FT. WAYNE, INDIANA



CONSOLIDATED CEMENT CORP., Chicago, Ill., has reported a profit of $86,362 for the six months ended June 30, 1941 as compared with a deficit of $3,599 for the same period in 1940. Net sales for the first six months of 1941 were $827,871 as against $648,722 in a like period in 1940.

•

ALBERENE STONE CORP. OF VA., New York, N. Y., had a net income of $47,158 for the first six months of 1941 as compared with $16,591 for a similar period in 1940. Net sales for the first half of 1941 were $401,162 as against $285,414.

•

BOSTON SAND & GRAVEL CO., Boston, Mass., reported a net loss of $15,200 for the year ended December 31, 1940, after depreciation, depletion, and interest, as against a net loss of $2,852 in 1939.

•

PENNSYLVANIA GLASS SAND CORP., Lewistown, Penn., had a net income of $395,231 for the first six months in 1941 as compared with $305,952 in a like period in 1940.

•

NORTH AMERICAN CEMENT CORP., New York, N. Y., announced a net loss of $127,382 for the year ended June 30, 1941, after depreciation, depletion, taxes and interest, but before profit on bonds purchased. This compares with a net loss of $387,478 for a like period ended June 30, 1940.

•

PACIFIC COAST AGGREGATES, INC., Los Angeles, Calif., showed the following consolidated earnings statement for the six months to June 30:

	1941	1940
Sales	$1,392,846	$860,214
Cost of sales	1,068,562	653,411
Selling & exp., etc.	72,403	54,888
General expense	65,506	56,646
Depreciation & depletion	114,930	94,395
Operating profit	71,445	874
Other income	22,142	18,215
Fed. income tax	10,841	.....
Net profit	82,746	19,089

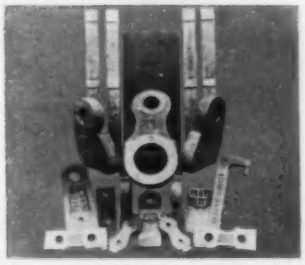
•

LEHIGH PORTLAND CEMENT CO., Allentown, Penn., reported a net profit for the 12 months ended June 30, 1941 of $2,638,790, after federal taxes, compared with $2,161,213 for a like period ended June 30, 1940.

•

ALPHA PORTLAND CEMENT CO., Easton, Penn., reported for the 12 months ended June 30 a net profit of $1,081,148, after depreciation, depletion and federal income and excess profits taxes, equal to $1.70 a share on the capital stock. This compares with $665,484 or $1.04 a share for the previous 12 months.

Specify TISCO



MANGANESE STEEL PULVERIZER PARTS *for* LOW COST FINE REDUCTION.....

There may be some crushing jobs that manganese steel will not handle successfully, but not many. In most plants crushing stone, gravel, ore, coal or coke, TISCO manganese steel is pre-eminent. It will outlast other alloys many times over when subjected to repeated impact.

Long wear and satisfactory crushing results will be obtained by the use of

TISCO MANGANESE STEEL

REPAIR PARTS FOR:

Jaw, gyratory & roll crushers
Hammer Mills & Pulverizers
Ball, Rod & Tube Mills
Shovel Dippers
Pumps • Dredges, etc.

TW

Manganese Nickel Steel
Welding Products
Alnico Permanent Magnets
Railway Trackwork
Gas Cylinders • Grinding Balls

Our 199th Year

TAYLOR-WHARTON IRON & STEEL CO.

HIGH BRIDGE, NEW JERSEY
PLANTS AT HIGH BRIDGE, N. J.—EASTON, PA.

BOSTON - CHICAGO - CLEVELAND - CHARLESTON, W. VA. - NEW YORK
PHILADELPHIA - PITTSBURGH - SAN FRANCISCO - SCRANTON

70% of All Ready-Mixed Plants

that own and operate Smith-Mobile Truck Mixers, have already come back for additional Smith-Mobiles — as many as 5, 10, 15 or even 25 units. And you can bet that the others will order more Smith-Mobiles as soon as they require additional machines. Surely, this fact is significant. Owners have learned from experience that it pays to replace the slow, old-style hatch-loading machines with faster, more efficient, more economical Smith-Mobiles. Why gamble with new, untried machines? Avoid imitations! Get the modern, time-tested Smith-Mobiles. Ask for Catalog No. 198-A.

THE T. L. SMITH COMPANY • 2885 N. 32nd St • Milwaukee, Wis.

SMITH-MOBILE *The Original High-Discharge* TRUCK MIXER & AGITATOR

A 3411-4H

VERMONT ASSOCIATED LIME INDUSTRY, INC., Leicester Jct., Vt., stockholders voted at their last meeting to reduce the capital of the corporation from $200,000 to $59,000. H. B. Huntley is president of the concern.

•

NATIONAL GYPSUM CO., Buffalo, N. Y., had the highest volume of sales in its history, for the first six months of 1941. Net earnings for the six months ended on June 30, amounted to $690,047 after provision for taxes amounting to $709,000, which increased more than a half million dollars over the same period in 1940.

FLORIDA PORTLAND CEMENT CO., Chicago, Ill., reported the following earnings account for the six months to June 30:

	1941	1940
Net sales	$1,980,137	$1,530,384
Cost of sales	1,199,606	971,554
Selling, etc., expenses	192,908	148,372
[1]Net profit:		
Mar. quarter	308,916	196,136
June quarter	278,707	214,322
6 months	$587,623	$410,458

[1] Before Federal income taxes.

•

LONE STAR CEMENT CORP., New York, N. Y., presented the following income account for the second quarter to June 30:

	1941	1940
Sales	$ 7,463,049	$5,662,040
Costs & expenses	4,751,895	3,640,457
Depreciation & depletion	642,839	718,933
Operating profit	2,068,315	1,302,650
Other income	105,146	58,441
Total income	2,173,461	1,361,091
Federal income tax, etc.	[2]891,871	399,608
[1]Miscellaneous charges	202,574	143,429
Net profit	1,079,016	818,055
6 mos. to June 30:		
Sales	$13,688,088	$9,892,146
Costs & expenses	8,839,872	6,485,761
Depreciation & depletion	1,308,197	1,272,309
Operating profit	3,540,019	2,134,075
Other income	191,965	117,928
Total income	3,731,984	2,252,003
Federal income tax, etc.	1,448,755	620,382
[1]Miscellaneous charges	349,217	260,012

[1] Includes provisions for doubtful account and contingencies.
[2] Includes excess profits tax.

Charles L. Hogan, president of the company, states: "Estimates of federal income and excess-profits taxes for 1941 have been calculated at the increased rates contained in the House Committee new tax plan. However, the excess-profits tax has been computed after deduction of normal income tax. The House Committee plan now provides for calculation of excess-profits taxes before deduction for normal income tax, which is a radical departure from present method, and, if such provision is enacted into law, the reserve for total Federal income taxes will have to be increased substantially."

•

LONGHORN PORTLAND CEMENT CO., San Antonio, Texas, reported the following income statement for the six months through June 30:

	1941	1940
ⓘ Net profit	$ 340,125	$ 328,748
Preferred dividends	32,237	32,237
Common dividends	187,185	124,790
Surplus for period	120,703	171,721
Previous earn. surplus	618,954	531,672
Tax adjustment, etc.	cr 81,582	998
Res., pfd. retire	5,373	5,373
Earnings surplus, 6-30	815,868	697,023
Times preferred dividends	25.32	24.47
Earnings, preferred share	$63.30	$61.19
Earnings, common, share	1.31	1.26

Number of shares: 5% preferred, 5,373, common, 249,580.
ⓘ After depreciation, depletion, federal income taxes, etc.

•

KENTUCKY STONE CO., INC., Louisville, Ky., on June 30, 1941, set aside one-half of its profits for the fiscal year ended April 30, 1941, estimated to be about $25,000, for the retirement of general income 5s due 1956. For the next 12 months, the Fidelity and Columbia Trust Co., Louisville, will be authorized to use such cash to buy outstanding bonds in the open market at not exceeding their face value.

MORE POWER..MORE PROFITS!

Compact, lighter in weight, the Murphy is a true DIESEL, providing real operating economy with simple, sturdy construction that means years of reliable performance. Generator Sets are rugged, compact, simple to operate — in every detail built for continuous heavy duty service.

Murphy Diesel engines are available in sizes 85 to 200 H. P.; generator sets 55 KW to 115 KW, A. C. or D. C.

Write for complete information.

MURPHY DIESEL COMPANY
MILWAUKEE, WISCONSIN

New York Highway Superintendents' Meet

THE ANNUAL CONVENTION of the New York State Town Superintendents of Hiways and Road Show will be held at Rochester, N. Y., September 18, 19, and 20. All producers of aggregates and others interested in highways are invited to attend this meeting.

Pan-American Highway Congress

ANNOUNCEMENT has been made that the fourth Pan-American Highway Congress will meet in Mexico City, September 15-24, 1941. An invitation extended to the American Road Builders' Association, Washington, D. C., by the Mexican Ambassador was accepted at the last convention and the ARBA has appointed a delegation to the Congress. This meeting will be of more than usual interest as the United States government has plans for loans to Central American and South American countries for completion of the Pan-American highway as a strategic defense measure. American manufacturers of road building machines and materials will participate in an educational exhibition.

Asbestos Plant

PHILIP CAREY MANUFACTURING CO., large manufacturer of asbestos, asphalt and magnesia products, has purchased a tract of land in Chicago and is planning a manufacturing plant for the site to fabricate asbestos pipe coverings into corrugated sections. The company has its own mines in Canada and operates manufacturing plants at Cincinnati and Middletown, Ohio; Plymouth Meeting, Penn., and other locations.

Labor Suit

GREENVILLE SAND AND GRAVEL CO., and Fisher Lime and Cement Co., Inc., Greenville, Miss., are fighting a suit in federal court brought by 39 employes charging violations of the fair labor standards Act. Greenville Sand and Gravel Co. recently purchased the towboat, Elinor.

Apply for Dredge Permit

YAZOO SAND AND GRAVEL CO., Yazoo City, Miss., has submitted an application for a permit to dredge sand and gravel from the Yazoo river at Yazoo City, 75.4 miles above the mouth.

Open Sand Pit

WAPSIE MATERIAL CO., Central City, Iowa, has opened another sand pit on the Carl Meints farm, east of Coggon, Iowa.

TRADE MARK
KEYSTONE
REGISTERED U. S. PATENT OFFICE

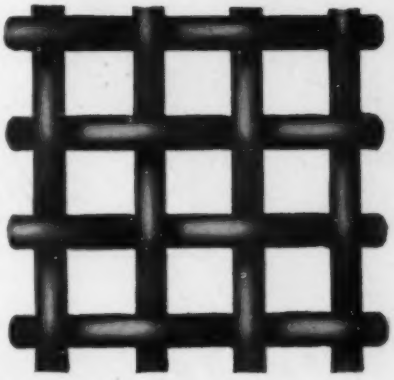
1-YARD and 1¼ YARD

Keystone offers a standard *1¼ yard dipper and crane, Model 19-A* for rock excavation and quarry clean-up. *Model 18-A, 1-yard,* is adapted for special service—*trench hoes* for crevice cleaning upon serrated rock strata; *skimmers* for sand-strata separation and recovery, etc. . . . we have had a long and varied experience in handling difficult and unusual excavation problems. Ask for bulletins.

ROCK SHOVELS
DIPPERS
BACK HOES
SKIMMERS
DRAG LINES
CRANES

KEYSTONE DRILLER CO.
Beaver Falls, Penna.

ROEBLING
ABRASO
SCREEN
JERSEY



ROEBLING STEEL
Assures Long Life

Roebling "Abraso" Screening is made of special steel—manufactured by *custom methods* in Roebling's own mill. It is steel that offers maximum resistance to the BEATING of stone and gravel.

To further assure long screening life, Roebling controls every step of manufacture from steel making to fabrication.

Roebling "Abraso" Screening is available for every sizing, cleaning and grading service.

JOHN A. ROEBLING'S SONS COMPANY
TRENTON NEW JERSEY

Branches in Principal Cities Export Division: 19 Rector St., New York, N.Y., U.S.A. Cable Address: "Roebling's", New York

OBITUARIES

EDWARD A. HERMAN, a veteran of the quarry industry, and president of the Reliance Whiting Co., Alton, Ill., died June 12. He was born December 28, 1856, and graduated from Renssalaer Polytechnic Institute in 1879. After graduation he entered railway service and became assistant chief engineer of the Big Four. He was also at one time Sewer Commissioner of St. Louis, Mo. Mr. Herman started the Reliance Whiting Co. in 1904 as the Reliance Quarry & Construction Co., which was later reincorporated under its present name. A fine grinding plant was installed in 1919. He is succeeded by his son, C. E. Herman, as president.

•

LEE S. TRAINOR, chief engineer, National Lime Association, died August 10 after a long illness.

•

DANIEL HEYWARD, treasurer and manager of the Winnsboro Granite Corp., Winnsboro, S. C., died July 30 at the age of 49, as a result of an automobile accident.

C. H. WILLBEE, founder of the Willbee Concrete Products Co., Jackson, Mich., died August 7 at his home in San Marino, Cal., at the age of 77. He founded the Willbee organization in 1911, being associated with his son, Charles E. Willbee, but retired from active business in 1937.

•

WILLIAM A. SMOOT, former mayor of Alexandria, Va., and president of the Smoot Sand & Gravel Corp., Washington, D. C., died July 25 at the age of 63. He had served as mayor from 1922 to 1930, and was the first president of the Alexandria Chamber of Commerce after its formation in 1906 and was again elected to that office in 1921. Mr. Smoot also was the first president of the National Coal Dealers Association. In 1918 he served in the State Legislature and was named to the board of visitors of Mt. Vernon by the last five governors. He is survived by his wife, Mrs. Harriet Smoot; his mother, Mrs. Betty Carter McGuire Smoot; a son, Albert A. Smoot; a brother, L. E. Smoot, and a sister, Mrs. Robert W. Fuller.

•

JASPER WHITING, who had one of the most colorful careers of anyone identified with the portland cement industry, died August 18 at the age of 73. He is best known in the industry as the inventor of the process of manufacturing cement from slag, but his eventful life included newspaper work as a reporter covering the Boxer rebellion in 1900 for the London, England, Westminster Gazette. In the last World War, he served as a major in the American armed forces. He also invented the Whiting cell for the manufacture of chlorine gas and caustic soda in manufacturing paper.

•

BURR H. SIMPSON, former president and general manager of the West Virginia Sand & Gravel Co., Charleston, W. Va., and of the Standard Brick & Supply Co., died August 10 at his home after an illness of several weeks. He was born in Upshur County, January 6, 1885, and was educated in the public schools and at West Virginia Wesleyan College, Buckhannon, later studying civil engineering at Ohio State University. He began his career in 1913 as rodman and instrument man on the construction of the Coal and Coke Railway.

•

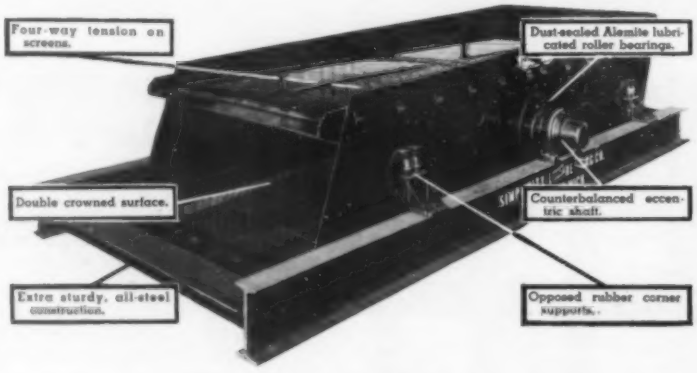
LEW WALLACE BROOKS, president of Brooks Equipment & Manufacturing Co., Knoxville, Tenn., died July 21.

CLEANER MATERIALS MORE ACCURATE SIZING

—SAY CUSTOMERS OF LARGE WESTERN FIRM USING *Simplicity* SCREENS

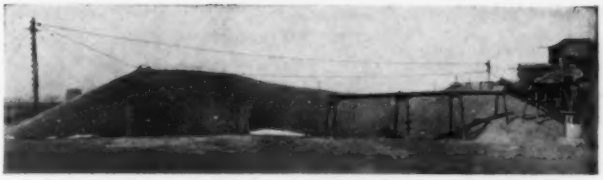
Recently the head of a large Aggregate Producing company in the West made this statement.—"I've always understood that Simplicity Gyrating Screens were good, but I didn't realize how good they are until after I installed that 4'x 10' triple deck screen in one of my plants. No other screen is one, two, three, when compared to a Simplicity. Hardly a day goes by without some one of my customers making some comment about how perfectly sized and cleaned my material now is. From now on its Simplicity screens for me—the best aggregate screen on the market."

You, too, can insure better cleaned, more accurately sized aggregates by installing a Simplicity Gyrating Screen. Write today for complete facts and prices.



Simplicity

ENGINEERING COMPANY · DURAND MICH.



Pictured above is a very simple scheme for storing and reclaiming surplus output by operating a small Sauerman Power Scraper on a long sloping pile between two masts, set up on open space alongside screening plant.

This picture shows how a Sauerman Slackline Cableway digs a large, deep pit and lifts material to top of screening plant in a straightline at a cost of just a few cents per yard. A sturdy machine that runs 24 hours a day, if necessary, with little attention.

GRAVEL, sand, crushed rock and other loose materials can be moved from pits, banks or stockpiles most cheaply with a Sauerman Drag Scraper or Cableway machine.

There is a double saving when you use a Sauerman machine. You keep down your equipment investment and your daily operating expense is lower than with any other equipment able to dig and haul an equal yardage. One man handles the entire operation. Capacities range from 10 to 1000 cu. yd. per hour.

Several interesting booklets have just been published showing just how various material-handling problems are solved with Sauerman machines. Write for these booklets today.

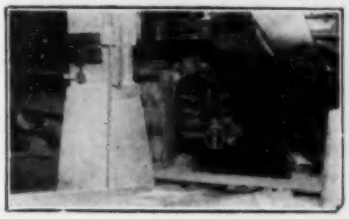
SAUERMAN BROS., INC.
430 S. Clinton St., Chicago

Sauerman LONG RANGE MACHINES

Why Crush Rock THE HARD WAY?

. . . when you can save money with a

KUE-KEN BALANCED CRUSHER ON THE JOB



This Kue-Ken 30 crushes a carload of rock in 5 hours . . . just six times as fast as the crusher formerly used.

One after another, owners of Kue-Ken Crushers write us, singing the praises of this amazing rock crusher. In one case the Kue-Ken paid for itself during the first three weeks of operation . . . paid for itself out of extra profits! Power requirements are extremely low . . . as little as 50% of the power required for crushers previously on the same jobs. Jaw plates last up to six times as long . . . one man gets 43,000 tons with a single set of jaw plates, where the crusher previously used, required new jaws after crushing only 9000 tons.

The Kue-Ken makes tremendous reductions . . . uses less power to do it (no secondary crusher needed). Almost 100% of power is converted to actual crushing. Balanced mechanism runs immersed in cool oil . . . it's vibrationless. No need for heavy foundations . . . can be mounted on tall bins or head frames . . . even on truck beds.

KUE-KEN WILL SAVE YOU MONEY! Get full information Now! Write today . . . there's no obligation. Ask for bulletin No. 610 and complete data sheets. There are several sizes available.

STRAUB Mfg. Co.
540 Chestnut Street
Oakland, California

(Pronounced COLE'-MON-OY)

Keep Your Machinery on the job with COLMONOY

You can't operate 24 hours a day and stop for many repairs. Use COLMONOY to hard-surface such wearing parts as conveyor screws, pulverizing hammers, gudgeons, clinker plows, crusher teeth, feeder sprockets and all other parts subject to excessive abrasion. Easy to apply. There's a grade for every hard-facing need.

WRITE FOR CATALOG
Full information on the various grades of COLMONOY for every hard surfacing requirement.

WALL-COLMONOY CORP.
Sixth Floor, Buhl Bldg., Detroit, Mich.

558 W. 54th St. NEW YORK — 625 W. Jackson Blvd. CHICAGO — 208 Midco Building TULSA
21 Seneca St. Blasdell, N. Y. — 123 W. Philadelphia St. WHITTIER, CALIF.

COLMONOY
Hard Surfacing Alloys and Overlay Metals

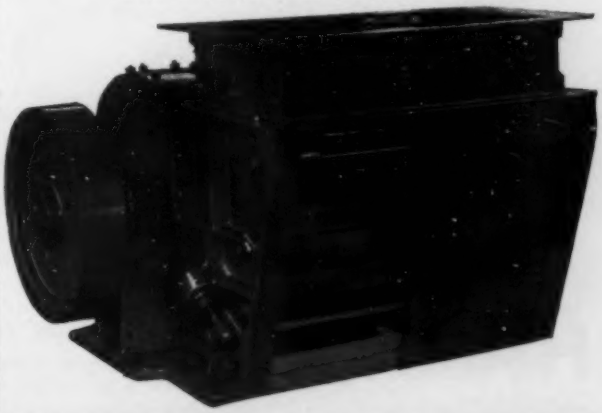
AMERICAN

FOR SPEED AND EXACTNESS COMBINE— Lowest Production Costs with Maximum Production

AMERICAN crushers are built to deliver a finished product at low cost per ton. Special features: Manganese Steel Wearing Parts —Alloy Steel Shaft—Heavy Duty Anti-Friction Bearings enclosed in dust-tight pillow blocks—Adjustable Grinding Plate—Accessibility.

Capacities 10 to 100 tons per hour. Reduce "man size" stone to ¾ in. aggregate in one operation day in and day out.

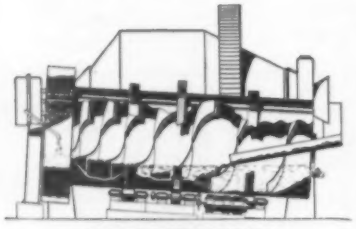
Write Today for Our Illustrated Catalog



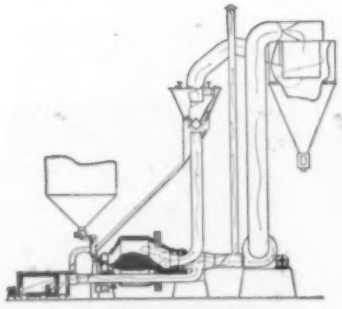
AMERICAN PULVERIZER CO.
1245 MACKLIND AVE. ST. LOUIS, MO.

HARDINGE MILLS
in the
DEFENSE INDUSTRIES
are grinding—

Aluminum
Carbide
Carbon
Chemicals
Chrome
Coke
Copper
Carborundum
Lead
Iron
Magnesium
Manganese
Molybdenum
Tin
Tungsten
Zinc



WET GRINDING



DRY GRINDING

HARDINGE
COMPANY, INCORPORATED
YORK, PA., Main Office & Works
NEW YORK, 122 East 42nd Street
CHICAGO, 205 W. Wacker Drive
SAN FRANCISCO, 501 Howard St.
TORONTO, 200 Bay Street

Complete Crushing Unit

THE DEL MASSEY SAND AND ROCK Co. has completed its new crushing plant south of Williams, Ariz. The quarry is on the side of a hill. Rock is dynamited, loaded into trucks with a shovel, and the loaded trucks practically use gravity to deliver the material to the crushing plant in the valley. Crushed rock is being furnished for WPA paving operations.

Cuban Terrazzo Chips Replace Italian

SHIPMENTS in sizable quantities of marble chips for use in terrazzo floor construction are expected to be made soon from Cuba to the United States. This material is being extracted from the marble quarries located in various parts of the Province of Pinar del Rio and it is believed that this is the first time that such material has been exported from Cuba to the United States. It is understood that this trade is made possible by the difficulty that has been experienced in obtaining marble chips from Italy or other Mediterranean areas.

Fire Destroys Crushed Stone Plants

FRANCE STONE Co., Toledo, Ohio, owners of the Miami Stone Co. plant near Delaware, Ohio, estimated that the recent fire caused damage amounting to $25,000. Only a short time ago, the plant was remodeled and new equipment worth $15,000 was added.

•

PIMA ROCK Co., west of Tucson, Ariz., reports that a fire recently destroyed most of the machinery and buildings of its crushed stone plant. Damage was estimated at $16,000. H. J. Karns, owner of the quarry, is said to have received substantial defense contracts.

Plan New Quarry

W. F. BRINKLEY, of the Granite Quarry Co., Salisbury, N. C., has purchased the rights to the huge deposit of granite discovered on the Reece B. Fowler farm, near Kannapolis, N. C. Mr. Brinkley plans to install a crusher for the production of crushed stone for the state highway department.

Anti-Trust Indictments

FOUR CORPORATIONS and seven individuals, charged with violation of the anti-trust laws in the production and sale of magnesite and magnesite brick were fined a total of $76,500 in the Federal District Court for the Southern District of New York.

Defendants fined were Harbison-Walker Refractories Co., Pittsburgh, P. B. Mossman, vice-president, W. B. Coullie, general sales manager, and P. R. Hilleman, secretary; General Refractories Co., Philadelphia, E. I. Greene, president, E. P. Heuer, vice-president, L. Y. Greene, vice-president and M. G. Myrelius, secretary-treasurer; Austro-American Magnesite Corp., Pittsburgh; and the Austrian Magnesite Co., Ltd., of Germany, a wholly-owned subsidiary of the Austro-American Magnesite Corp.

Start Agstone Plant

LIME PRODUCTS Co., has established an agricultural limestone crushing plant eight miles south of Harrison, Ark., on Highway 65. According to an announcement by Wm. S. Brantingham, manager, the federal government has awarded the company contracts totalling 60,000 tons of agstone. Other plants are operated by this company at Fayetteville, Berryville, and Huntsville.

New Crushed Stone Operations

THE PEERLESS LIME PRODUCTS Co., Rices Landing, near Waynesburg, Penn., started operations in a plant which cost about $25,000. J. H. Pekoski, Pittsburgh, Penn., is president, and C. I. Ruper, Waynesburg, is vice-president in charge of the plant.

•

MONROE LIME Co., is the name of a new company which has set up agricultural limestone crushing plants at Scottsville and Tompkinsville, Ky. Harlan Comer is manager of the company.

•

PLANS are being made to reopen the old marble quarry near Fallsvale, Calif., for the purpose of producing 175,000 tons of crushed stone. William Ball, Los Angeles, Calif., is owner of the property.

•

OWL ROCK Co. is the name of a new company which started operations in a plant at Owl Siding, three miles east of Banning, Calif. The first order is for 10,000 tons of ballast from the Southern Pacific Railroad. Another order for 7000 cars is expected.

•

STATE GRANITE Co., Amberg, Wis., is the name of a new company which is expected to start operations in the near future.

•

GEORGE BAKER, Rutland, Iowa, has reopened an agricultural limestone plant south of Ruland, Iowa. The quarry has been inactive since 1938.

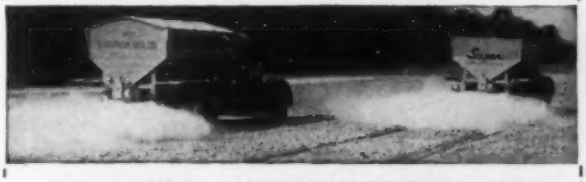
SPREAD LIMESTONE
THE BAUGHMAN WAY

Baughman spreaders assure even distribution of limestone up to 40-ft. width through a specially-designed revolving disc. In models that can be attached to flat or dump trucks, each spreader is a self contained unit with built-in drives and controls.

Write for detailed literature.

The MIRACLE Spreader—fits any truck. Can be removed or attached in 10 minutes after original installation.

The MAMMOTH Spreader. In models ranging from 6 to 18 tons. Wider, bigger and stronger than any other on the market.



BAUGHMAN MANUFACTURING CO.
Specializing in Spreading Equipment
JERSEYVILLE, ILL.

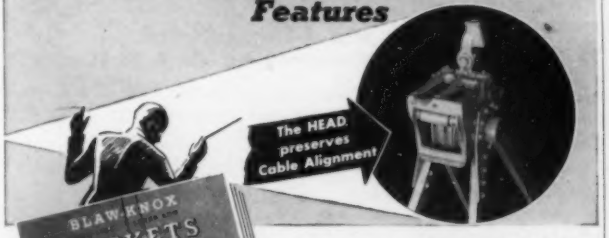
ROBINS *Gives You*

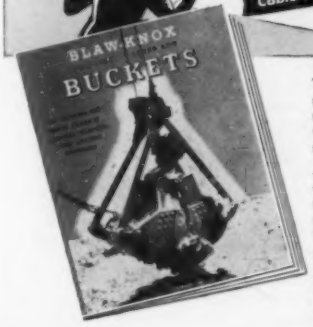
MORE MILES per IDLER

Robins uses the best materials and doesn't skimp on quality of workmanship. Robins Triple Grease Seals keep grease in and dust out. Pulley assemblies are identical, interchangeable, reversible. "One-Shot" lubrication fills all bearing chambers from either side—no dangerous reaching under the belt or loose grease pipes.

ROBINS CONVEYING BELT COMPANY
PASSAIC, NEW JERSEY

You get Operating Advantages in BLAW-KNOX BUCKETS *due to better Structural Features*





The rigid head in Blaw-Knox Buckets preserves fixed cable alignment between upper and lower sheaves, avoiding cable wear caused by loose or wobbly head construction.

All four corner bars are mounted directly on the head pin, thus all impact or pounding action between the head and scoop structure is transmitted directly and not through bolts or rivets.

This and many other exclusive features of Blaw-Knox Buckets are explained and illustrated in CATALOG No 1757 Write for your copy today

BLAW-KNOX DIVISION
of BLAW-KNOX COMPANY
Farmers Bank Building • Pittsburgh, Pa.

46

BLAW-KNOX *Digging and Rehandling*
BUCKETS
BLAW-KNOX BINS AND BATCHERS · ROAD FORMS · STREET FORMS · CONCRETE SPREADERS · TAMPING ROLLERS · VIBRATORS
CONCRETE BUCKETS · CLAMSHELL BUCKETS · TRUCK MIXERS · STAYING MACHINES · TURNTABLES · ROAD FINISHERS · STEEL FORMS

The Full Clearance *Prevents Clogging*

You can eliminate clogging—and cut your screening costs—by using Hendrick Perforated Plate on your vibrating and shaking screens. The full clearance prevents clogging, thereby providing finer, lower-cost screening.

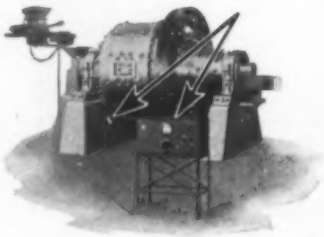
Hendrick Perforated Plate is available in practically any size or shape of perforations, and in a variety of metals, particularly Hendrick High Carbon Heat Treated Steel. Write for data.

HENDRICK MANUFACTURING CO.
47 Dundaff St., Carbondale, Pa.
SALES OFFICES IN PRINCIPAL CITIES
PLEASE CONSULT TELEPHONE DIRECTORY

Makers of Elevator Buckets of all types, Mitco Open Steel Flooring, Mitco Shur-Site Treads and Mitco Armorgrids. Light and Heavy Steel Plate Construction.

INCREASE YOUR MILL CAPACITY BY INSTALLING THE "ELECTRIC EAR" SOUND CONTROL

Experience has proven that the installation of the "Electric Ear" controlling the feed to Ball, Pebble, Tube or Rod Mills results in a 10 to 20% increase in mill capacity.



HARDINGE
COMPANY, INCORPORATED - YORK, PENNSYLVANIA
NEW YORK, CHICAGO, SAN FRANCISCO, TORONTO

FARREL BACON
CRUSHERS
Complete plants designed and equipped, including Screens, Elevators and Conveyors. Machinery for Mines and Rock Quarries, Sand and Gravel Plants.
Engineering Service

EARLE C. BACON, Inc.
17 John St., New York, N. Y.

Gypsum Products In Strong Demand

SECOND QUARTER reports from the Bureau of Mines show a continuing strong demand for gypsum products of all kinds. The overall improvement is indicated by the increased tonnages of domestic crude available and calcined gypsum output which were, respectively, 31 and 18 percent higher than in the April-June period of 1940.

Cantonment construction and residential building have called for a greatly increased volume of lath, wallboard, tile and insulating and roof-deck plasters.

Crude gypsum mined in the April-June, 1941 quarter amounted to 1,197,689 tons as compared to 917,234 tons. Calcined gypsum produced totaled 1,026,987 tons in the second quarter this year as against 869,174 tons in 1940. Gypsum lath sales amounted to 472,696,000 sq. ft. in the second quarter this year as compared with 384,195,000 in 1940; wallboard, 225,319,000 sq. ft. as against 127,243,000 sq. ft.; and tile 11,267,000 sq. ft. as compared with 8,329,000 sq. ft.

On the Labor Front

WESTERN SAND & GRAVEL CO., Spring Valley, Ill., recently settled a strike involving laborers' and truck drivers' unions with an agreement for a 30-day arbitration period in which to settle differences over a demand for an increase in the hourly wage from 65 to 75c an hour.

•

UNITED STATES GYPSUM CO., Chicago, Ill., is now meeting with union labor representatives at hearings before the Defense Mediation Board in Washington, D. C. M. H. Basquin, vice-president in charge of operations heads the company delegation, and the union has 22 representatives, led by O. E. Gasway, president of District 50 United Mine Workers. It is reported that the shutdown in some of the company's plants has affected 40 percent of the total output of gypsum.

•

WORKERS in the National Gypsum Co. plant in New York are reported to have voted 103 for District 50 CIO to 29 for the AFL in a recent NLRB election.

•

AN INJUNCTION has been obtained by the United States Gypsum Co. against the United Mine Workers, District 50, restraining the defendants from "trespassing, damaging property, and from interfering with employes and other persons entering or leaving its Port Clinton, Ohio, plant.

THE PACIFIC PORTLAND CEMENT CO. recently was faced with an AFL jurisdictional battle at its San Juan Bautista plant which threatened to cause a shut-down. The San Jose, Calif., building trades union objects to carpenters, plumbers, and other tradesmen working under the United Cement, Lime and Gypsum Workers union blanket contract. An oil shortage due to the refusal of oil truck drivers to go through the picket line would eventually close the plant.

•

CHENEY LIME & CEMENT CO., Landmark, Ala., has signed a new contract with local union 554, International Union of Mine, Mill & Smelter Workers.

•

GRAY KNOX MARBLE CO., Knoxville, Tenn., has signed a contract with the United Cement, Lime and Gypsum Workers International Union.

Concrete Pavement Yardage

AWARDS of concrete pavement for July, 1941, have been announced by the Portland Cement Association as follows:

	Sq. Yds. awarded during July, 1941
Roads	4,824,609
Streets and Alleys	2,705,870
Airports	9,593,640
Total	17,124,119

Total square yards of pavement for the first seven months of 1941 totals 49,340,878 as compared with 32,481,420 for the similar period in 1940.

Sand-Lime Brick Production and Shipments

TEN active sand-lime block and brick plants reported for July and nine for June, statistics for which were published in August.

AVERAGE PRICE FOR JULY

	Plant Price	Delivered Price
Grand Rapids, Mich.	....	$14.00
Detroit, Mich.	....	16.00
Sebewaing, Mich	$10.50	....
Saginaw, Mich.	11.00	....
Seattle, Wash.	16.00	18.00
Mishawaka, Ind.	12.00	13.75
St. Louis, Mo.	....	....
Minneapolis, Minn.	9.00	11.00
St. Louis Park, Minn.	8.50	10.50
Syracuse, N. Y.	14.00	16.00C/L 20.00L/C

STATISTICS FOR JUNE AND JULY

	*June	**July
Production	4,811,875	3,751,650
Shipments (rail)	72,500	100,000
Shipments (truck)	4,312,213	3,856,607
Stock on Hand	2,134,567	1,770,737
Unfilled Orders	1,269,000	2,140,000

* Nine plants reporting: incomplete, one not reporting stock on hand and three not reporting unfilled orders.

** Ten plants reporting: incomplete, two not reporting stock on hand and three not reporting unfilled orders.

Uniform Separation

The new model GAYCO Centrifugal air separator makes possible the uniform and increased recovery of cement and other extremely fine materials within a range of 60 to 400 mesh.

- Greater Capacity
- Cleaner Tailings
- 99% Through 325 Mesh
- 25% to 30% greater recovery of fines.
- Not affected by variation in speed or rate of feed.

Manufacturers also of "Reliance" Crushers, Screens, Elevators, Conveyors, Bin Gates, Grizzlies. Complete crushing, screening and washing plants for crushed stone, sand and gravel.

UNIVERSAL ROAD MACH'Y CO.

Rubert M. Gay Division 117 Liberty St. New York, N. Y.
Canadian Representative: F. H. Hopkins & Co., Ltd., Montreal

THOUSANDS of men in industrial plants, mines and mills all over the country are doing just what this man is doing. They are cutting costs by repairing conveyor belts with Flexco HD Rip Plates.

WRITE TODAY FOR BULLETIN F-100 that shows how easy it is to repair rips, to strengthen soft spots and to put in patches by using Flexco HD rip plates. The bulletin also shows how to make tight butt joints in both conveyor and elevator belts with Flexco HD Belt Fasteners. These fasteners are made in six sizes. Furnished in special analysis steel for general use and in various alloys to meet special conditions.

Flexco HD Rip Plate

Flexco HD Belt Fastener

FLEXIBLE STEEL LACING CO.
4684 Lexington St., Chicago, Ill.

FLEXCO HD BELT FASTENERS
Sold by supply houses everywhere

"Nat-Aloy" Uniform Temper Lock Crimp Meshes Assure Accuracy for the Life of Screen

Tough screens that resist abrasion, will not crystallize. Longer life—less replacements. Furnished also in flat top and double crimp meshes. Long slot screens.

Immediate shipments from stock . . . all width, all meshes . . . Attractive prices.

WRITE FOR NEW CATALOG NO. 55

NATIONAL WIRE CLOTH CO., Inc.
252-270 W. FAIRFIELD AVE. — ST. PAUL, MINN.

JEFFREY

CHAINS -:- CONVEYORS
ELEVATORS -:- FEEDERS
SCREENS -:- CRUSHERS
PULVERIZERS -:- PORTABLES

EFFICIENT — DEPENDABLE — ECONOMICAL

The Jeffrey Manufacturing Company
935-99 North Fourth Street Columbus, Ohio

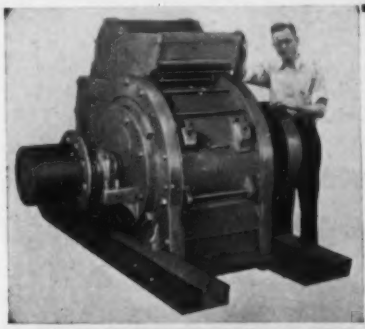
ROCK PRODUCTS

The Industry's Recognized Authority

Keeps you in step with every trend, every development in the Rock Products and Concrete Products Industries. It is edited to fit your exact needs.

ONE YEAR (12 Issues) only . . . $2.00
Or TWO full years for 3.00

309 West Jackson Blvd., Chicago, Illinois



W-I-D-E Crushing Range of DAY Swing Hammer Pulverizers

. . . makes one machine serve the purpose of two or more other types of crushers. The toughest crushing jobs are "All in a DAY'S work."

Write for Bulletin.

Brooks EQUIPMENT & MFG. CO
KNOXVILLE TENNESSEE

"PENNSYLVANIA" REVERSIBLE HAMMERMILL

boosting the efficiency of the secondary reduction at a western Cement Plant, by Major Impact Crushing,— Automatic Hammer Turning, — and Sharply Reduced Upkeep Costs.

A REVERSIBLE Hammermill may afford just the increased output and efficient uninterrupted production which you now need to keep pace with demand upsurge.

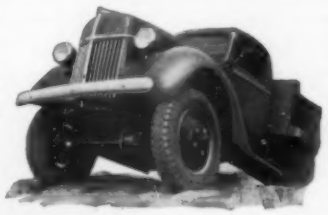
"PENNSYLVANIA" Engineers are at your service.

PENNSYLVANIA CRUSHER COMPANY

Liberty Trust Building
Philadelphia

MARMON-HERRINGTON

All-Wheel-Drives "Have What It Takes" in Pits and Quarries . . .



It takes **traction** to haul heavy loads through loose rubble and up steep grades. Marmon-Herrington **All-Wheel-Drive** converted Fords are unbeatable in this difficult service, offering unrivaled performance, and dependability at most reasonable cost. Write for literature.

MARMON-HERRINGTON CO., INC.
INDIANAPOLIS, INDIANA, U. S. A.

PERFORATED METAL SAND AND GRAVEL SCREENS

Manufactured exactly to your specifications

Any size or style screen, in thickness of steel wanted with any size perforation desired.

We can promptly duplicate your present screens at lowest prices

CHICAGO PERFORATING CO.
2437 West 24th Place
CHICAGO, ILLINOIS
Canal 1459

HAYWARD BUCKETS

WON'T QUIT OR CAUSE TIME OUT

A Hayward Bucket keeps the job going ahead on scheduled time. It won't quit or cause time out.

THE HAYWARD COMPANY
202-204 Church Street
New York, N. Y.

WILFLEY centrifugal SAND PUMPS

for Slurries, Sand Tailings, Slimes, Acid Sludges

Save Pumping Costs

Continuous operation without attention for long periods. Stuffing box, stuffing, gland water ALL eliminated. Close clearances maintained by easy slippage seal adjustment. Heavy pumping parts of material best suited for YOUR particular problem. Complete engineering service. Prompt shipment of parts. The most efficient and economical pump you can buy. *Write for Complete Catalog*

A. R. WILFLEY & SONS, Inc., Denver, Colo., U. S. A.
NEW YORK OFFICE: 1775 BROADWAY

McLANAHAN EQUIPMENT

CRUSHERS

Single and double roll and jaw crushers, hammer mills, super dry pans—steel log washers and scrubbers, sand dragg, revolving and vibrating screens, elevators, conveyors, dryers, jigs, hoists.

SCREENS

Complete portable, semi-portable and stationary crushing, screening, and washing plants for different capacities of any materials.

McLanahan & Stone Corp. Established 1835 HOLLIDAYSBURG, PENNSYLVANIA

SAVE STEEL FOR NATIONAL DEFENSE

WELD Jaw Plates, Gyratory and Roll Crushers, Shovel Teeth, Hammers, Tractor Tread Grousers

with

MANGANAL

Reg. U. S. Pat. Office. U. S. Patents 1,876,739—1,947,167—2,021,945

11 to 13½% Manganese Nickel Steel

WELDING ELECTRODES, WEDGE and APPLICATOR BARS, HOT ROLLED PLATES

STULZ - SICKLES CO. *Sole Producers* 134-142 Lafayette St., Newark, N. J.

Sold Thru Distributors Only

67 POUNDS of SPEED and POWER!

Gardner-Denver S73 Sinker

Speed and power to drill faster in harder ground—economical air consumption—powerful rotation—excellent holding characteristics. Weighs 67 pounds. For complete information, write today to Gardner-Denver Company, Quincy, Illinois.

GARDNER-DENVER
Since 1859

Federal Contract Awards

AWARDS made by Federal governmental agencies to rock products companies for the period from July 7 to Aug. 2 as reported by the Division of Public Contracts, Department of Labor, are as follows:

Cement

* Various sources.

† Indefinite Amounts.

California Portland Cement Co., Los Angeles, Calif., War, $33,800.

Dewey Portland Cement Co., Dewey, Okla., War, $110,100.

Oklahoma Portland Cement Co., Ada, Okla., War, $67,760.

Lone Star Cement Corp., Birmingham, Ala., from Berlin G. Myers, Navy Yard, S. C., WPA, $27,000.

*Material Service Co., Chicago, Ill., WPA, $48,356.

Monolith Portland Midwest Co., Laramie, Wyo., from Rivett Lumber & Coal Co., Omaha, Nebr., WPA, $76,281.

*Schwartz Supply Co., Inc., New Orleans, La., WPA, $11,337.

Alpha Portland Cement Co., Easton, Penn., WPA, $13,072.

*The American Hard Wall Plaster Co., Rome, N. Y., WPA, $29,698.

California Portland Cement Co., Los Angeles, Calif., WPA, $16,400.

Monolith Portland Midwest Co., Laramie, Wyo., Int. Recl., $39,025.

Santa Cruz Portland Cement Co., San Francisco, Calif., WPA, $185,000.

Calaveras Cement Co., San Francisco, Calif., WPA, $185,000.

Monolith Portland Cement Co., Los Angeles, Calif., WPA, $195,000.

Cowell Portland Cement Co., San Francisco, Calif., WPA, $185,000.

California Portland Cement Co., Los Angeles, Calif., WPA, $14,175.

*Stephenson-Browne Lumber Co., Chickasha, Okla., WPA, $52,084.

Universal Atlas Cement Co., Waco, Texas, from Waco Lumber Co., NYA, $13,296.

Monolith Portland Cement Co., Los Angeles, Calif., Int. Rcl., $18,600.

*Dixon Lumber Co., Dixon, Mo., WPA, $50,297.

Riverside Cement Co., Los Angeles, Calif., War, $72,800.

Universal Atlas Cement Co., Independence, Kans., War, $11,650.

Whitehall Cement Mfg. Co., Cementon, Pa., from John A. McCarthy & Co., WPA, $87,882.

*Majestic Bldg. Materials Corp., Overland, Mo., WPA, $86,594.

*Geo. Kellett & Sons, Inc., New Orleans, La., WPA, $29,835.

*Woodson Lumber Co., Inc., Fairfield, Ala., FWA, $10,700.

†Material Service Corp., Chicago, Ill., NYA.

†Consumers Co., Chicago, Ill., NYA.

Sand and Gravel

* Various Sources.

Montaup Sand & Gravel Co., Inc., Swansea, Mass., War, $23,000.

*Vandigriff Construction Co., Montgomery, Ala., FWA, $18,300.

Katharine F. Hurd, Owl's Head, Maine, WPA, $12,150.

W. W. Leighton, Alfred, Maine, WPA, $18,800.

Pacific Building Materials Co., Portland, Ore., WPA, $66,650.

Missouri-Illinois Material Co., St. Louis, Mo., WPA, $46,219.

Theo. Montgomery, San Angelo, Tex., WPA, $20,968.

Lyman-Richey Sand & Gravel Corp., Omaha, Nebr., WPA, $18,136.

L. E. Reel, Forrest Hill, La., WPA, $30,000.

*General Construction Co., Portland, Ore., WPA, $135,200.

S. E. Willey, Inc., Plainville, Ohio, WPA, $14,055.

Cleveland Slag Co., Cleveland, Ohio, from City Material & Coal, Inc., WPA, $21,335.

Standard Slag Co., Youngstown, Ohio, from Bower & Sons, Farmdale, Ohio, WPA, $13,259.

Erie Sand & Gravel Co., Erie, Penn., WPA, $43,400.

Memphis Stone & Gravel Co., Memphis, Tenn., WPA, $26,250.

Consumers Co., Chicago, Ill., WPA, $21,228.

Construction Service Corp., Springfield, Mass., War, $21,600.

Union Paving Co., San Francisco, Calif., WPA, $59,045.

State Sand & Gravel Co., Belfast, Maine, WPA, $18,900.

Herbert Sargent, Stillwater, Maine, WPA, $14,625.

Leahy Washed Sand & Gravel Co., Littleton, Mass., WPA, $12,960.

A. J. Wise, Washington, D. C., WPA, $14,500.

Tampa Sand & Material Co., Tampa, Fla., WPA, $10,530.

Charles Black Sand & Gravel Co., Hammond, La., WPA, $22,330.

Muskogee Gravel Co., Muskogee, Okla., WPA, $20,538.

Kelley Island Lime & Transport Co., Sandusky, Ohio, and Home Sand Co., Fremont, Ohio, from Modern Construction Co., Fremont, Ohio, WPA, $12,837.

Layman Construction Co., Tulsa, Okla., War, $42,600.

Crushed Stone

* Indefinite Amount.

The Barcla Quarries, Inc., New Haven, Conn., WPA, $30,400.

Horowitz Brothers, Wethersfield, Conn., WPA., $16,600.

Silliman & Godfrey Co., Bridgeport, Conn., WPA, $11,250.

New Haven Trap Rock Co., New Haven, Conn., WPA, $70,250.

Sam Finley, Inc., Roanoke, Va., WPA, $24,467.

New Haven Trap Rock Co., New Haven, Conn., $43,610.

Ansco Construction Co., Long Beach, Calif., WPA, $21,855.

*Florida Lime Rock Sales Corp., Ocala, Fla., WPA.

Material Service Corp., Chicago, Ill., WPA, $15,685.

Mills Rock Co., of Miami, Inc., Miami, Fla., WPA, $54,120

Dudley Stone Products Co., Inc., El Paso, Tex., WPA, $29,260.

Pioneer Quarry & supply Co., Vigus, Mo., WPA, $54,630.

Basalt Rock Co., Inc., Napa, Calif., from John Cassaretto Co., WPA. $11,200.

General Crushed Stone Co., Winchester, Mass., WPA, $35,802.

John S. Lane & Son, Inc., Meriden, Conn., WPA, $14,450.

Superior Stone Co., Raleigh, N. C., WPA, $22,648.

Raleigh Granite Co., Raleigh, N. C. WPA, $32,650.

Wm. S. Rogers, Cartersville, Ga., WPA, $15,355.

Theo. Montgomery, San Angelo, Texas, WPA, $24,070.

Milwaukee Limestone Products Co., Hales Corners, Wis., WPA, $12,298.

Connell & Shultz, Inverness, Fla., War, $58,462.

Cummer Lime & Mfg. Co., Ocala, Fla., War, $58,462.

Connell & Shultz, Inverness, Fla., War, $25,537.

Cummer Lime & Mfg. Co., Ocala, Fla., War, $25,537.

Florida Crushed Stone Co., Leesburg, Fla., War, $19,800.

Central Mill Co., Cardin, Okla., from Diplomat Gravel Co., Galena, Kans., War, $123,000.

(Continued on page 90)

PYRASTEEL
for high temperatures
SEGMENTAL
KILN ENDS

FOR any diameter of cement kiln . . . . . insures tight sealing, saves fuel, improves burning, reduces production costs. Standard units are easy to handle and simple to install. Segment can be replaced without tearing down ring. *Write for Bulletin.*

Chicago Steel Foundry Company
37th Street at Kedzie Avenue
Chicago, Illinois
Makers of Alloy Steel for 30 Years

GYROSET
VIBRATING SCREEN
5 DISTINCTIVE FEATURES . . .

1. Full Floating Shaft.
2. Eight Positive Stroke Adjustments (quickly changed).
3. Oil Lubricated.
4. Sturdy Construction.
5. Screen Cloth Easily Changed.

★

LOW COST—EFFICIENT—ECONOMICAL

Write for Bulletin No. 939

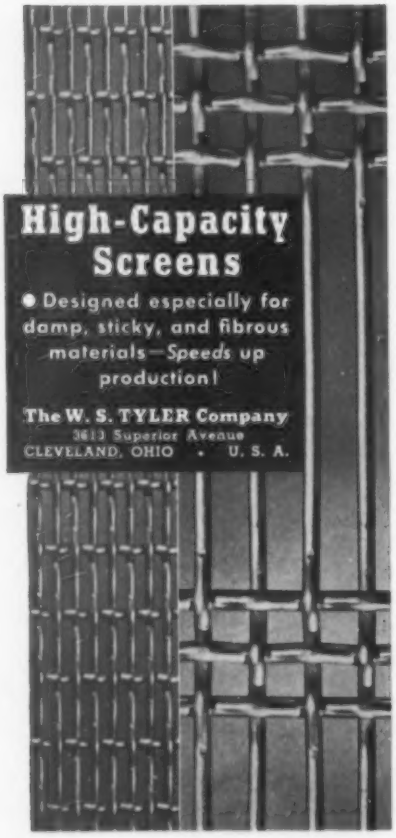
Productive Equipment Corp.
2926-28 West Lake St., Chicago, Ill.

No Other Crusher Will Work for You Like This

DIXIE NON-CLOG Hammermills and Regular Stationary Breakers are unexcelled for primary, secondary or fine reduction. Note the simple, sturdy swing hammer construction and the specially designed, continually moving breaker plate which is an exclusive DIXIE feature. This is an exceptionally powerful and dependable unit for handling cement, rock, clay, shale, silica, sand, gypsum, coal, etc. Made in 40 different sizes.

Write for further details.

DIXIE MACHINERY MFG. CO.
4109 Goodfellow Ave. ST. LOUIS, MO.


High-Capacity Screens
● Designed especially for damp, sticky, and fibrous materials—Speeds up production!
The W. S. TYLER Company
3613 Superior Avenue
CLEVELAND, OHIO • U. S. A.

Granite Rock Co., Watsonville, Calif., WPA, $85,000.

John S. Lane & Son, Inc., Meriden, Conn., WPA, $16,123.

Limestone Products Corp. of America, Newton, N. J., War, $11,437.

C. M. Lyle Construction Co., Gainesville, Ga., TVA, $13,000.

Birmingham Slag Co., Birmingham, Ala., TVA, $34,675.

Traffic and Transportation

PROPOSED RATE CHANGES—The following are the latest proposed changes in freight rates up to and including the week of August 16:

Southwestern

25325. **Barite rock or barite ore, crude,** Malvern, Ark., to Collinsville, Ill. To establish a rate of $4.40 per ton on barite ore or barite rock, crude, not ground (see Note 2), but not less than 80,000 lb. from Malvern, Ark., to Collinsville, Ill.

25326. **Barite rock or barite ore, crude,** Malvern, Ark., to Coffeyville, Kan. To establish a rate of 30c per 100 lb. on barite rock or barite ore, crude, not ground (see Note 2), but not less than 80,000 lb. from Malvern, Ark., to Coffeyville, Kan.

Southern

26230 (carrier). **Road building material,** C. L. Establish from Birmingham and Ensley, Ala., to Melbourne, Fla., 385c; Ft. Pierce and Vero Beach, Fla., 396c net ton.

26240. **Limestone, crushed,** C. L.. Establish 225c net ton. Dolcito, Ala., to Lake Charles, La.

New England

55044. **Ground talc,** minimum weight 60,000 lb., Highwater, Que., to Boston, Mass. Present—31 (6th class). Proposed—23.

55152. **Silica sand,** min. wt. 50 tons, except when cars of lower capacity are furnished for carriers' convenience (see Note 1). Boston, Mass., to Glens Falls, N. Y. Present—25 (6th class as per Agent Doe's I. C. C. 160). Proposed—$1.75 per net ton. Reason—To enable the rail carriers to obtain a haul on this traffic.

Trunk

40026 (Sup. 1) (carrier). **Limestone, ground or pulverized,** C. L., min. wt. 60,000 lb., from Muncy, Pa., to Akron, Ohio. $2.59 per net ton in lieu of present rate of 28c per 100 lb.

40064 (carrier). **Ground talc,** C. L., min. wt. 60,000 lb., from Highwater, Que., to Boston, Mass., 23c; Providence, R. I., 24c; Sterling, N. Y., 25c; Brooklyn, New York, N. Y., Jersey City, Newark, N. J., 27c; Long Island City, N. Y., 31c; Philadelphia, Pa., Trenton, N. J., Wilmington, Del., 32c; and Baltimore, Md., 35c; rates in cents per 100 lb. (see Note 5). Reason—Rates on a comparable basis with others involving like distances.

Central

66207. **Granules (silica),** C. L., min. wt. 60,000 lb. W. D. A. 66207, D. B. 3077, dated March 8, 1941 covering proposal to establish rate of 314c per net ton on, from Brittain and Copley, O., to Northfield, Ill., is hereby withdrawn from docket on request of proponent.

66748. **Sand and gravel,** regardless of description. W. D. A. 66748, D. B. 3083, dated April 22, 1941, covering proposal to cancel all rates, ex-lake or otherwise, on, from Toledo, O., to destinations in C. F. A. territory, except to pts. in state of Ohio, is hereby withdrawn from docket pursuant to action of general committee at July meeting.

67768. **Limestone, agricultural,** unburned (not ground or pulverized) in bulk, in open top cars only, C. L. Establish on, from Narlo, O., to Beloit and Garfield, O., 138c per net ton.

67791. **Sand, all kinds, and gravel,** in open top cars, C. L. Establish on, from Overpeck, O., to Mineral Ridge, O., 198c per net ton.

67795. **Sand,** industrial, per usual descriptions (a), (b) and (c). Establish on, from pts. in the M. & S. Valleys Group, viz.: Burnetts, Geauga Lake,, O., Greenville, Helein, Leesburg, Pa., Mahoning, Ohlton, O., Osgood, Pa., Phalanx, O., Edenburg, Schollard and Voland, Pa., to Prince, W. Va., (a) 308c; (b) 339c; (c) 308c per net ton.

67799. **Sand** (all kinds) and **gravel,** in open top cars, C. L. Establish on, from Chardon, O., to Bucyrus, O., 138c and Columbus, O., 160 per net ton.

67800. **Stone, crushed and screenings, stone, crushed,** in bulk, in open top cars and on **agricultural limestone,** unburned (not ground or pulverized), in bulk, in open top cars only, C. L. (see Note 3). Establish on, from Narlo, O., to stations on B. & O. R. R. in Ohio, viz.: Warwick, 116c; Lowellville, *154c; Canal Fulton, 116c; Bridgeport, 160c; Columbus Grove, 94c; Cairo, 99c; Sidney, 110c; Troy, 127c; Dayton, Carlisle, 138c; Hamilton, 149c; Middletown, 138c; College Corner, 149c; Arcanum, 138c; Mill Grove, 127c; Columbia Park, 171; Blanchester, 149c; Hillsboro, 160c; Chillicothe, 138c; Dyers, 149c; Belpre, 171c; Swift, 149c; Philo, 138c; Bloom Jct., Portsmouth, Black Fork, 171c; Washington C. H., 138c per net ton.

*To apply on agricultural limestone only. Rate on crushed stone to be 149c.

67828. **Gravel and sand, building,** other than industrial sand, in open top cars, in straight or mixed C. L. (see Note 3). Establish on, from Massillon, O., to South Heights, Pa., 132c per net ton.

(Continued on page 90)

Note 1—Minimum weight marked capacity of car.

Note 2—Minimum weight 90% of marked capacity of car.

Note 3—Minimum weight 90% of marked capacity of car, except that when car is loaded to visible capacity the actual weight will apply.

Note 4—Reason: No present or prospective movement.

Note 5—Reason: Comparable with rates from other origins in immediate vicinity.

Note 6—Rates will not apply on shipments in cars with tarpaulin or other protective covering. In such instances the rates applicable on shipments in box cars are to be assessed.

Note 7—The oil, tar or asphaltum not to exceed 10% of weight of the commodity shipped, the shipper to so certify on shipping order or bill of lading.

New Incorporations

Concrete Pipe Corp., Menasha, Wis., has filed articles of incorporation to handle sand and gravel, pipe and other construction materials. Capital stock is listed as $25,000. Incorporators are Homer H. Benton, Alfred C. Bosser and Edgar E. Becker of Appleton, Wis.

All-Concrete Products Co., Milwaukee, Wis., has been incorporated with a capital of 200 shares, no par value, to manufacture concrete products. Incorporators are Eugene and Marie Leipold and Genevieve Williams. Daniel B. Antin, 710 N. Plankinton Ave., Milwaukee, Wis. is agent in charge of business.

Garden Prairie Stone Co., Inc., 104 South St., Marengo, Ill., has been incorporated with a capital of 500 shares, no par value common. Incorporators are L. W. Ackman, P. W. Jevne and D. M. Jevne. Paul W. Jevne, Marengo, Ill., is agent in charge of business.

Charlestown Stone Co., Inc., Hardinsburg, Ind., has been organized with a capital of 1,000 shares, no par value, to deal in sand and gravel. Incorporators are Max Radcliff, Albert Berry, William Ehringer, Jr., and John Regan.

Concrete Pipe Corp., Menasha, Wis., has been organized with a capital of 250 shares at $100 per share, to deal in all concrete products. Incorporators are Alf C. Bosser, Edgar E. Becker, Homer H. Benton. Benton, Bosser, Becker & Parnell, Appleton, Wis., are agents in charge of business.

Deptford Sand & Gravel Co., Inc., Woodbury, N. J., has been incorporated with a capital of $100,000. Lynwood Lord is the agent.

Dura-Stone Corp., Chicago, Ill., has been organized with a capital of 1,000 shares, no par value common, to deal in buildings and building materials. Incorporators are D. Harris, H. C. Giventer and J. Gollob. Ratner, Miller & Levinson, 100 W. Monroe St., Chicago, are the agents.

Sand & Gravel Enterprise, Inc., Deepwater, N. J., has been incorporated with a capital of 2,000 shares. Mitchell E. Apostolatos is the agent.

Manufacturers News

The Foxboro Co., St. Louis, Mo. office has changed its address to Continental Building, 3615 Olive Street, St. Louis, Mo. E. B. Miller is manager, and R. H. Hemfelt is assistant manager.

Farrell-Birmingham Co., Inc., Ansonia, Conn., has awarded service emblems to 577 employes. A handsome sterling silver service pin was awarded to 139 employees who have completed 20 to 25 years of service, while 438 who have been with the company for 10 to 20 years received a bronze emblem.

PULVERIZERS for the reduction of Cement Materials, Limestone, **Agricultural Limestone,** Fire Clay and All Dry, Refractory Materials.

Capacities: 1 to 60 tons per hour — Finenesses: 20 to 350 mesh

BRADLEY PULVERIZER CO.

ALLENTOWN, PENNA.

To Increase Capacities or Fineness of Present Grinding Plant—
To Reduce Power and Maintenance Costs—
To Insure an Absolutely Uniform Product—

***Use the* BRADLEY AIR SEPARATOR**

THE Leahy HEAVY DUTY

No-Blind VIBRATING SCREEN with TRI-VIBE —for Fine Mesh Screening

GUARANTEES PERFORMANCE with
No Screen Frame Breakage
No Tearing up Screen Cloth along the Sides
No Power Waste
Operates at full capacity and efficiency with 1 H. P. motor
Write for Bulletin No. 14-H.

THE DEISTER CONCENTRATOR COMPANY
The Original Deister Co., Est. 1906
915 GLASGOW AVE. FORT WAYNE IND.

THE ROSS FEEDER

Completely controls the flow of any size material from Storage Bins, Hoppers or Open-Dump Chutes to Crushers, Conveyors, Screens, etc.

High in efficiency. Low in maintenance and power consumption.

Furnished in sizes to suit your operation. Send full particulars for recommendation.

ROSS SCREEN & FEEDER CO.

19 Rector Street
NEW YORK, U. S. A.

2 Victoria Street
LONDON, S. W. 1., ENGLAND

A BIG *full* LOAD WITH EACH BITE

Because of their design and construction, Industrial Brownhoist clamshell buckets take extremely full loads with each bite, practically eliminate the need for hand shoveling, speed up material handling and cut handling costs. Quantity production plus our manufacturer-direct-to-you policy reduces your bucket investment. Write today.

INDUSTRIAL BROWNHOIST BUCKETS

INDUSTRIAL BROWNHOIST CORP., BAY CITY, MICHIGAN • DISTRICT OFFICES: NEW YORK, PHILADELPHIA, PITTSBURGH, CLEVELAND, CHICAGO

Make Your Screening Surfaces More Effective with

HARRINGTON & KING
PERFORATED METAL SCREENS

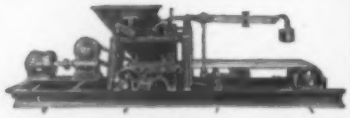
Their perforations are properly spaced to give greatest capacity without loss of strength and durability. Any size, any shape, any metal, any perforation.

Write for illustrated catalog.

The Harrington & King Perforating Co

5650 Fillmore St., Chicago—114 Liberty St., N. Y.

PROPORTION BY WEIGHT



WITH POIDOMETERS

Many cement plants are using Poidometers for proportioning raw and finish materials, and also cement and hydrated lime for Masons cement. Poidometers are also being used for feeding materials to grinding mills, and coal to dryers. The Poidometer is self-contained. The scale beam is graduated in pounds or kilos, and can be set at whatever amount of material may be required per foot of belt travel; the gate is then adjusted to suit this weight, and the machine will deliver the pre-determined amount of material with an accuracy of ninety-nine per cent.

Send for bulletin on the improved Poidometer with electrically operated regulating gate.

Write for Bulletin No. 2-A and get complete profit-producing facts!

Schaffer Poidometer Co.
2828 Smallman St. PITTSBURGH, PA.

Transportation and Traffic

(Continued from page 88)

67829. **Agricultural limestone,** unburnt, in open top cars, C. L. Establish on, from Sandusky, O., to Kimbolton, O., 138c; Cambridge, Byesville, Pleasant City, O., 149c; Caldwell, O., 160c per net ton, via P. R. R. direct.

67830. **Agricultural limestone,** unburnt, in open top cars, C. L. Establish on, from Marion, O., to Cadiz, O., 149c per net ton, via P. R. R. direct.

67832. **Slag, crushed or crushed commercial** (not granulated) in open top cars, C. L. Establish on, from Hamilton, O., to Hartman, Ind., 138c per net ton.

67833. **Sand (all kinds), and gravel,** in open top cars, C. L. Establish on, from Akron, O., to Charlestown, O., 55c per net ton.

67834. (a) **Sand,** industrial, in all kinds of equipment, C. L.; **sand** (except naturally bonded moulding; ground or pulverized sand) in closed equipment, C. L.; (c) **sand** (except industrial), in open top equipment, C. L. (See Note 1), C. L. actual weight will apply, but orders will not be accepted for closed and open top cars of less marked capacity than 60,000 lb. and 80,000 lb., respectively (See Note 2). Establish on, from Savanna, Ill., to Muncie, Ind., 253c per net ton.

67494. **Brucite and dolomite combined** (calcined or dead burned), C. L., min. wt. 60,000 lb. Establish on, from Narlo, O., to Knoxville, Tenn., 29c.

67801. **Dolomite** (refractory dolomite in granular form, treated or untreated, clinkered and burned to a dead state), C. L. Establish on, from Durbin, O., to Holt, Ala., 518c per net ton, via N. Y. C. (C) direct to Cincinnati, O., Louisville, Ky., Evansville, Ind., and Cairo, Ill., Sou. lines to furnish routing beyond.

67770 (2). **Brucite and dolomite combined** (calcined or dead burned), min. wt. 60,000 lb. Establish on, between S. W. F. B. territory and S. W. F. B., Kans.-Mo. and Gateway territories (Territory "A"), when originating at Narlo or Maple Grove, O., Class 12.

67883. **Limestone; agricultural, ground or pulverized,** C. L. Cancel all rates on, from Anderson Road, Penn., Bentley, O., Crescentdale, Ellwood, Penn., Lowellville, O., New Castle, Quaker Falls and Wampum, Penn., to points in Ill., Ind., Ia., Ky., Md., Mich., Mo., N. Y., Ohio, Penn., W. Va., and Wis., published in P. & L. E. R. R. Trfs. I. C. C. 3300 and 3301, and similar tariffs of other individual lines, classification basis to apply.

67884. **Sand** (except industrial) in open top equipment, C. L., except that when car is loaded to full visible or cubical capacity, actual weight will apply, but orders will not be accepted for closed and open top cars of less marked capacity than 60,000 lb. and 80,000 lb., respectively (See Note 2). Establish on, from Michigan City, Ind., group, viz.: Oak Hall, Mich., Michigan City, Calumet, Gary, Miller, Dune Park, Willow Creek, Crisman, Crocker and Porter, Ind. to Muncie, Ind., 138c per net ton (See Note 6).

67902. **Sand** (except industrial in closed equipment without tarpaulin or other protective covering, C. L. Establish on, from Lock No. 3, Penn. to Neville Island, Penn., 77c per net ton, via P. & L. E. R. R.

67903. **Sand** (except industrial) in closed equipment, C. L. Establish on, from Essex, Ill., to Terre Haute, Ind., 187c per net ton, via Wab.—Danville—C. & E. I. or Wab.—Newell—C. M. St. P. & P. or Wabash—Danville—C. C. C. & St. L.

67907. **Agricultural limestone,** unburnt, in open top cars, C. L. Establish on, from Sandusky, O., to Broadacre, O., 138c per net ton, via P. R. R. direct.

67847. **Calcium or lime silicate of,** in multiple wall paper bags, C. L., min. wt. 40,000 lb. Establish on, from Barberton, O., to Group 1 Pacific coast points, 105c.

Southwestern

25359. **Ground limestone,** Cartersville, Tate and Whitestone, Ga.; also Sparta Tenn., to Arkadelphia, Camden, Little Rock and Pine Bluff, Ark., Shreveport, La., and Texarkana, Ark.-Tex. To establish joint through commodity rates in cents per ton on ground limestone, C. L., from Cartersville, Tate, Whitestone, Ga., and Sparta, Tenn., to Arkadelphia, Camden, Little Rock, Pine Bluff, Ark., Shreveport, La., and Texarkana, Ark.-Tex., as follows:

To	From Cartersville, Ga.	Sparta, Tenn.
Arkadelphia, Ark.	328	306
Camden, Ark.	328	306
Little Rock, Ark.	295	284
Pine Bluff, Ark.	306	284
Shreveport, La.	328	350
Texarkana, Ark.-Tex.	350	328

To	Tate Ga.	Whitestone, Ga.
Arkadelphia, Ark.	350	350
Camden, Ark.	350	350
Little Rock, Ark.	328	328
Pine Bluff, Ark.	328	328
Shreveport, La.	350	361
Texarkana, Ark.-Tex.	383	383

25419. **Asphalt rock, chatts, gravel, sand or stone,** Carley, Tex., to Arkansas, Louisiana and Oklahoma. To amend SWL Tariff 162-Q to provide that rates applicable from Hearne, Tex., are to apply as maxima from Carley, Tex., on asphalt rock, chatts, gravel, sand or stone (as described in item 20, SWL Tariff 162-Q) to destinations in Arkansas, Louisiana (west of Mississippi River) and Oklahoma.

25455. **Super phosphate (acid phosphate), other than ammoniated,** Shreveport, La., to Jackson, Miss. To establish rate of 15c per 100 lb. on super phosphate, C. L., min. wt. 80,000 lb., from Shreveport, La., to Jackson, Miss.

25473. **Barite rock or barite ore,** Beaman, Boonville and Sedalia, Mo., to Houston, Tex. To establish rate of $6 per ton on barite rock or barite ore, crude, not ground, C. L. (See Note 2), but not less than 80,000 lb., from Beaman, Boonville, and Sedalia, Mo., to Houston, Tex.

25476. **Barium, sulphate of,** southern producing points to stations in Oklahoma. To establish rate of 48c per 100 lb. on sulphate of barium as described in Item 818, S. W. L. Tariff 3, from southern points to Oklahoma stations shown in that item.

Trunk

40065 (shipper). **Crushed stone,** C. L., from Security Md., to various points in Maryland and Pennsylvania, rates ranging from 121c to 154c per net ton. Reason: (See Note 5).

40066 (shippers). **Sand** (other than ground or pulverized), in closed cars, C. L., from Cumberland, Md., to Baltimore, Md., 187c per net ton in lieu of present 6th class rate of 21c per 100 lb. Reason: (See Note 5).

40069 (shipper). **Limestone,** crude, fluxing, foundry and furnace, when shipped in open top equipment, C. L. (See Note 3), from Martinsburg, Engle, W. Va., Stephens City, Capon Road and Strasburg Junction, Va., to Donora, Pa., 116c per gross ton in lieu of present 6th class rates 23c to 25c per 100 lb. Reason: (See Note 5), others to destination in the same general territory.

40069 (Sup. 1) (shippers). **Limestone, crude, fluxing, foundry and furnace,** when shipped in open top equipment (See Note 3), from Annville, Palmyra and Swatara, Penn., to Donora, Penn., 139c per gross ton.

40073 (shippers). **Magnesite, calcined,** or **dead burned,** C. L., min. wt. 40,000 lb., from New York, N. Y., to Chippewa, Ont., 29c per 100 lb., present rate 38c. Reason: Proposed rate compares favorably with rates to other destinations.

40090 (shippers). **Asphalt filler,** C. L., min. wt. 60,000 lb., from Whiteford, Cardiff, Md., Delta and Slate Hill, Penn., to Gillespie, N. J., 242c per net ton in lieu of current 6th class rate of 23c per 100 lb. (See Note 5).

40092 (Sup. 1) (shippers). **Silicate of soda,** dry or other than dry, C. L., as described in Rate Proposal 40092, from Philadelphia and Chester-Marcus Hook, Penn., to London, Ont., 42c per 100 lb. in lieu of current rate of 56c per 100 lb.

40099. To cancel all commodity rates on **crushed stone,** from Cavetown, Hagerstown and Williamsport, Md., to all points. Reason: (See Note 4).

40120 (shippers). **Asphalt filler,** C. L., min. wt. 60,000 lb., from Whiteford, Cardiff, Md., Delta and Slate Hill, Penn., to Economy, Penn., 308c, and to Wampum, Penn., 319c per net ton in lieu of current 6th class rates of 28c and 30c per 100 lb., respectively. Reason: (See Note 5).

40122 (shippers). **Sand,** in open top cars, without tarpaulin or other protective covering, C. L. (See Note 3).

(Rates in cents per 2000 lb.)

	From West Elizabeth Penn.	From Courtney Penn.
Braddock, Penn.	66c	66c
Verona, Penn.	77	77
Brackenridge, Penn.	77	88
Latrobe, Penn.	88	88
Midland, Penn.	99	99
Weirton, W. Va.	99	99
Neville Island, Penn.	99	99
Monessen, Penn.	110	110
Johnstown, Penn.	99	110
Steubenville, O.	105	105
Aliquippa, Penn.	110	110
Monaca, Penn.	110	110

Reason: Comparable with rates from and to other points.

40134 (shippers). **Gravel, sand, slag** and **crushed stone,** coated with oil, tar or asphaltum, in bulk, in open top equipment in straight C. L. (See Notes 2 and 7), from Clarksburg, W. Va., to stations on B. & O. R. R. in the states of Maryland, Pennsylvania and West Virginia taking Index Nos. 1860 to 2340, 2480 to 5855, and 6592 to 8710, as shown in Agent Leland's List of Open and Prepay Stations, on basis of the following mileage rates:

	Rates in Cents per 2000 Lb.
20 miles and under	80
40 miles and over 20 miles	91
60 miles and over 40 miles	102
80 miles and over 60 miles	113
100 miles and over 80 miles	124
125 miles and over 100 miles	135
150 miles and over 125 miles	146
175 miles and over 150 miles	157
200 miles and over 175 miles	168
225 miles and over 200 miles	177
250 miles and over 225 miles	185

In lieu of current class rates. Reason: Comparable with rates from and to other points.

E-155-17. **Fluorspar,** C. L., from Boulder, Canon City, Denver, Fort Logan, Remaco, Roberts Spur and Waterton, Colo. Proposed, to representative points: Group 3 (Chicago, Ill.), 50,000 lb., 735; Detroit, Mich., 60,000 lb., 928; New York, N. Y., 60,000 lb., 1210, being C. L. min. wt.

Manufacturers' News Notes

Iron & Steel Products, Inc., Chicago, Ill., has appointed Paul G. Cheatham, Jr., of F. I. Madero, No. 55, Mexico, D. F., as their representative for Mexico to succeed Sr. P. C. Morales who has resumed his old position as general superintendent of motive power and machinery, National Railways of Mexico.

Western Precipitation Corp., Los Angeles, Cal., reports the death of Evald Anderson, technical director, ending a career of unusual accomplishment. Mr. Anderson was one of the outstanding engineers of the country in his chosen field of activity.

Chain Belt Co., Milwaukee, Wis., has made the following appointments: W. B. Marshall, who has been assistant sales manager of the conveying and engineering products division, has been made sales manager of that division. B. E. Sivyer, former San Francisco branch manager, has been transferred to Milwaukee as assistant sales manager of the chain belt and transmission division. Replacing Mr. Sivyer as branch manager at San Francisco is S. Y. Warner. J. Walter Snavely, district manager in the Houston territory for seven years, has returned to the sales department of the conveying and engineering products division at Milwaukee. W. A. Pitts, formerly representative in Oklahoma City, has been appointed district manager of oil well sales at Houston. George Hunt has been appointed district manager of industrial sales with headquarters at Dallas, Texas.

J. Walter Snavely

Macwhyte Wire Rope Co., Kenosha, Wis., announces that the directors at a recent meeting voted Robert B. Whyte vice-president in charge of operations in acknowledgment of his outstanding services as general superintendent. His connection with the wire and wire rope industry dates back to 1913. Other officers of Macwhyte Co. are George S. Whyte, chairman of the board; Jessel S. Whyte, president and general manager; H. E. Sawyer, vice-president and treasurer; Howard Gay, secretray; M. A. Buntrock, assistant secretary and assistant treasurer.

The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc., Passaic, N. J., announces the death of H. S. Sturges, traffic manager, after a short illness. Mr. Sturges had been associated with Manhattan for 33 years. T. E. Conklin, assistant traffic manager, will succeed Mr. Sturges as traffic manager, and W. H. McKean is appointed assistant traffic manager.

The B. F. Goodrich Co., Akron, Ohio, has registered the name "Transcord" with the United States Patent Office, and will use the name as a brand to denote the use of the company's transverse cord breaker in either cord conveyor or fabric conveyor belting.

The Ransome Concrete Machinery Co., Dunellen, N. J., has appointed The Highway Machinery and Supply Co., Inc., 1724 Altamont Avenue, Richmond, Va., as exclusive distributor in the State of Virginia to handle their complete line of construction equipment.

Kellogg Switchboard & Supply Co., Chicago, has announced the selection of F. G. Gardner to fill the position of acting chief engineer. George R. Eaton, vice-president in charge of engineering, is taking a leave of absence because of ill health.

HARDSOCG'S
DRILL FASTER with LESS AIR
New Type valve — lighter than other valves — operates the V-55 rock drill.
Drill has very strong rotation. Offset handle gives nice balance in operation.
Write for Complete Specifications and Details.
HARDSOCG Drill Company
Box 376
Ottumwa, Iowa

"Established in 1885"

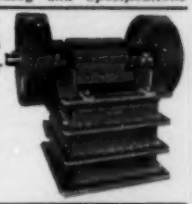
NEW LOW COST GRAVEL CRUSHING

To meet the exact aggregate requirements in Road Construction and Concrete Work

GRUENDLER EQUIPMENT

FREE—16-Page Catalog and Specifications

JAW CRUSHERS
Bronze or Roller Bearing
Heavy armor plate steel or cast steel.
Heavy Duty Construction
Large capacity
Small power Requirements



For Secondary Crushing
DOUBLE ROLL CRUSHER
From 18" to 40" Diameter

Heavy Duty Revolving Screens
Up to 84" Diameter

Combination Revolving Gravel Washer and Screen

GRUENDLER Vibrating Screens,—Jack Leg Winch Type Bins,—Bucket and Heavy Duty Belt Conveyors,—Loading Equipment are meeting the exact demands of the Industry.

GRUENDLER
CRUSHER • PULVERIZER • GRINDERS

GRUENDLER CRUSHER & PULVERIZER CO.
2920-26 N. Market St., St. Louis, Mo.

Classified Advertisements

POSITIONS WANTED — POSITIONS VACANT Set in six-point type. Minimum $1.00 each insertion, payable in advance.

INFORMATION—Box numbers in care of our office. An advertising inch is measured vertically in one column. Three columns, 30 inches to the page.

CLASSIFIED—Displayed or undisplayed. Rate per column inch, $5.00. Unless on contract basis, advertisements must be paid for in advance of insertion.

IMMEDIATE SHIPMENT IS IMPORTANT TODAY

READY—No Waiting for Delivery with CONSOLIDATED Used Machinery

OLIVER FILTERS

3—Oliver Rotary Continuous Filters, 8'x10', wood stave, closed steel head, steel trough, oscillating agitator, reduction gear drive, no motor, complete with receivers, pumps.

GYRATORY CRUSHERS

1—16" Telsmith No. 7.
1—36" Superior McCully.
1—20" Superior McCully.

GYRATORY REDUCTION CRUSHERS

1—1'8" Traylor TY.
1—410-TZ, capacity 150 t.p.h. through 1¼" square mesh; 10" feed opening.
1—Kennedy No. 25 with motor in pulley.
1—Kennedy No. 49 with motor in pulley.
1—Kennedy No. 19, V-belt drive.

JAW CRUSHERS

66x86 Traylor; 36x24 Farrel; 24x36 Allis-Chalmers; 8x36 Universal Roll Jaw; 18x30 Allis-Chalmers and smaller sizes.

HAMMER MILLS

32"x15" Penna. 8X-2, 4x1" hammers, adj. grate.
36"x24" Gruendler No. 4XA, 60—3"x1" hammers.
24" Mikro Pulverizer No. 4-TH, stirrup hammers.
No. 5 Williams Roller Knife Shredder, 40"x30".
No. 4 and No. 6 Williams "Jumbo".
20" dia. x 24" Dixie, direct conn. 40 H.P. A.C. motor.
24"x20" Jeffrey Type B-2 Shredder.
30"x24" Stedman, Model "A".
No. 3 and No. 5 Jay Bee Mills.

2—6'x12' ROD MILLS

Hardinge straight side Rod Mills, iron lined, herringbone steel gears, enclosed gear drive units, charge of rods with each mill. Arranged for peripheral or trunnion discharge. In excellent condition and for immediate shipment.

ROTARY DRYERS, DIRECT HEAT

Ruggles-Coles, double shell: 5'x26', 5'x30', 6'x35', 5'6"x60', 80"x45'.
Single Shell: 4'x30', 5'x30', 6x40, 6x50, 6x60, 7'x60', 8x60

ROTARY KILNS

6'60', 8'x110'.

DIESEL GENERATING SETS

1—560 H.P. F-M, Model 23, Style M, 257 RPM, 4-cyl., 16"x20", with magnetic clutch and pulley take-off. Used two years.
2—1200 H.P. McIntosh & Seymour, Type 8-B-40, 8-cyl., 20"x24", 250 RPM. For sale with or without direct connected 800 KW Westinghouse d.c. generator. We have just sold two of these sets.

VIBRATING SCREENS

3—4'x7' Leahy, 2 deck, motor driven.
8—3'x5' Tyler Hummer, 2 deck, No. 31, enclosed.
2—4'x7' Jeffrey-Traylor, Type FB-4, 2 deck.
2—3'x7' Simplicity, 2 deck, motor driven.
2—3'x8', 3'x10' Niagara, 3 deck.
1—4'x8' Huron, 1 deck, V-belt drive.

LIME HYDRATORS

Weber Sr type, made by Arnold & Weigel with No. 1 Raymond Bros. Lime Separator; also Kritzer.
One complete Hydrated Lime Plant.

CENTRIFUGAL AIR SEPARATORS

10' Sturtevant; 8', 10', 12', 14' Gayco; 6' Raymond; also 5' dia. Raymond "Whizzer" for attachment to roller mill. 5' Gayco.

BALL, ROD AND TUBE MILLS

Ball Mills: 6x6, 6x8.
Rod Mills: 4'x8', 6x12 Hardinge, straight side.
Tube Mills: 2—5'x20' Bonnot Co., silex lined.
1—5'x22' Bonnot Co., silex lined.
6'x23', 2—6'6x20' Smidth, silex lined.
5'x22' Allis-Chalmers, 5'x35' Vulcan, both iron lined.

RAYMOND PULVERIZERS

2—4 roll High Side, located Toledo.
Nos. 0000, 00, 1 and 3, Beater type—also Nos. 55, 60, 90 Imp type.

CONSOLIDATED PRODUCTS CO., INC.

15-16-17 PARK ROW *Our Shops at Newark, N. J., cover eight acres.* **NEW YORK, N. Y.**

BUCYRUS 50-B 2 yd. electric shovel, a.c., on cats, dismantled, in good condition.
CLYDE 10-ton revolving steel guy derrick, 70' boom, electric hoist, guys, etc., A-1.
BUCYRUS 80-B high lift, steam cat. shovel, with 2¼ yd. dipper, early model but good.
BROWNING and McMYLER locomotive cranes, 20—25 tons, steam & gas, 50' booms, working now, arch bar trucks, prompt release
NORTHWEST 1-yd. Model 105 gas combination crane-shovel, older model but new tracks, good working condition.
CATERPILLAR 60 gas tractors (9).
EUCLID cat wagons (13), 8-yd., 6 on rubber.
FAIRBANKS-MORSE 360 hp marine type Diesel engine, Model 35, good condition.
TUG, steel, gas power, 45', 180 hp Sterling.
CEDAR RAPIDS portable gravel crushing and screening plant, tandem, cap. 60 yds. hr.
MONIGHAN Walker dragline, elect., 3-yd., 70' boom.
BARBER-GREENE No. 42 bucket loader, A-1.
Locomotives, gas & steam, various gauges & wts.
H. V. SMITH CO., 928 N. B'way, Milwaukee, Wis.

FOR SALE

KILNS: 8' x 80', 8' x 110', 7' x 121'.
DRYERS: 3' x 11', 5' x 36', 4' x 40', 5½' x 32', 6' x 60', 6' x 40', 7' x 55'.
CRUSHING ROLLS: 6" x 5", 24" x 14", 42" x 16".
JAW CRUSHERS: 16" x 24", 10" x 36", 10" x 42".
BALL MILLS: 5' x 8', 6' x 6', 5' x 22', 6' x 22", 8' x 30".
RAYMOND MILLS: No. 0000, 00, 1, also 3, 4 and 5 Roller Mills.
HAMMER MILLS: Williams, Gruendler, Jeffrey, etc.
SCREENS: Tyler-Hummer, Sturtevant.

We Purchase Single Items to Complete Plants.

BRILL Equipment Corporation
183 Varick Street
New York City

CRUSHERS

GYRATORY: 42" Gates K. 30" Superior McCully (Like new). 20" Superior McCully, Gates Nos. 12, 10, 9, 8, 7½, 6, 5, 4, 3, 2, 1 (75 avail.) Telsmith Nos. 4, 5, 6, 8C, 9 & 16. Also many Austins, Kennedys and Traylors, many sizes.
JAW TYPE: Traylor 60x84, 48x60, 42x48, 24x72. Superior 84x66 & 24x36. Buchanan 30x42. Farrel 60x42, 30x36, 24x36, 18x36, 12x24. Good Roads 1030. Acme 24x40. Misc. 7x12, 9x16, 8x20, 8x24, 12x24, 9x36, 9x30, 15x36.
REDUC. TYPE: Kennedy Nos. 25, 37 & 49. Telsmith 2-F & 40. Traylor 36" TZ, 8", 10", 12". Super. McCully 6" & 10". Newhouse 5, 7 & 10". Symons Cone & Disc Ty. 2' to 4'.
ROLLS: Allis-C. 12½x12, 36x10, 40x15, 54x24 & 72x30. Fairmount 36x60 & Jeffrey 24x24 to 36x54 single roll. Cornish 36x14 & 42x16. Etc., Etc.
HAMMERMILLS: Williams No. 1, 2, 3, 4, 8 & 9. Jeffrey 36x18 & 36x42. Day Nos. 20 & 40. Etc.
MILLS: Kennedy Ball 4x6, 5x6 & 5x8. Marcy 8x6 & 10x9. Hardinge 6'x3', 8'x30' & 6'x9'. Misc. Tube Mills 5' & 6' x 22'. Sturtevant Ring Roll, Raymonds, Kents, Fuller-Lehigh, Etc., Etc.
CRUSHING PLANTS: No. 65 Diamond No. 22 Pioneer 8x24, 1030 Good Roads, 9x40 Austin-Western, 9x36 C.R.

MISCELLANEOUS ITEMS

Barges, Bins, Buckets, Boilers, Cableways, Cars, Compressors, Conveyors, Cranes, Dryer, Derricks, Draglines, Drag Scrapers, Dredges, Drills, Engines, Elevators, Excavators, Generators, Hoists, Kilns, Locomotives, Loaders, Motors, Pipe, Pumps, Rail, Scales, Screens, Slacklines, Shovels, Tanks, Trucks, Tractors, Etc., in many sizes, types and makes at low prices. **(I have equipment at many points in the United States and Canada. What you need may be near your plant.)**

ALEXANDER T. McLEOD
7229 Rogers Avenue **CHICAGO**

FOR SALE

1—Stiff legged steel derrick, 10-ton capacity, 40' mast, 75' boom, steel lattice construction, equipped with 3-drum Clyde hoist with independent swinger, and 1-cu. yd. Blaw-Knox clam shell bucket. Without motor.

1—Stiff legged steel derrick, 10-ton capacity, 40' mast, 75' boom, steel lattice construction, equipped with National 3-drum hoist with independent swinger, and 1-cu. yd. Blaw-Knox clam shell bucket. Without motor.

For further particulars address

American Zinc Company of Tennessee
Mascot, Tennessee

RAILS AND ACCESSORIES

RELAYING RAILS—Super-quality machine-reconditioned—not ordinary Relayers.

NEW RAILS, Angle and Splice Bars, Bolts, Nuts, Frogs, Switches, Tie Plates, all other Accessories. Although our tonnages are not as large as heretofore, most sizes usually available. Every effort made to take care of emergency requirements.

PHONE, WRITE OR WIRE

L. B. FOSTER COMPANY, Inc.
PITTSBURGH NEW YORK CHICAGO

FOR SALE

Complete plant equipment. Stearns Clipper stripper, mixers, all sizes of pallets and mold boxes. Can be seen in operation.

LITTLE ROCK LUMBER & COAL CO.
ALMA, MICHIGAN

ELECTRICAL MACHINERY

Motors and Generators, A.C. and D.C., for sale at attractive prices. New and Rebuilt. All fully guaranteed. Write for List and Prices.

V. M. NUSSBAUM & CO.
Fort Wayne, Indiana

"PENNSYLVANIA" CRUSHERS

To move quickly, subject prior sale, two 18" x 24" STEELBUILT Pennsylvania heavy duty Single Rolls for Limestone, Lime, Clinker, or Coal; one SX-4 Steelbuilt Trojan Hammermill. All excellent condition.

PENNSYLVANIA CRUSHER CO.
Liberty Trust Bldg., Philadelphia, Pa.

FOR SALE

We own and offer 1 Deane Bros. Triplex Pump—7x8x8 in condition equal to new, at reasonable price. Also 50,000 gallon metal tank on 75' steel tower.

WALKER ENGINEERING CO.
GASTONIA, N. C.

¾, 1, 1¼ yd. Owen & Williams Buckets
30, 35 HP Gas Hoists
50, 60, 100 HP Elec. Hoists
1¼ Nwest Shovel Attachment
1¼ B-Erie 41B Shovel Attachment
1 yd. Page Dragline Bucket
½, ¾, 1¼ Gas Crawler Cranes

J. T. WALSH
Brisbane Bldg. **Buffalo, N. Y.**

BARGAIN PRICES

ON

RUBBER BELTING

TRANSMISSION—CONVEYOR—ELEVATOR

"V" BELTS

FOR

PUMPS—CRUSHERS—PULVERIZERS—ETC.

RUBBER HOSE

FOR

AIR—WATER—STEAM—ETC.

Partial Stock List

NEW AND HEAVY DUTY

Conveyor and Elevator Belting

Quantity	Width	Ply	Top Cover	Bottom Cover	Type
500 Ft.	48"	8	1/8"	1/16"	Conveyor
505 "	36"	6	1/8"	1/16"	"
856 "	30"	6	1/8"	1/16"	"
520 "	30"	5	1/8"	1/16"	"
180 "	24"	6	1/16"	1/16"	Elevator
2305 "	24"	5	1/8"	1/32"	Conveyor
1298 "	24"	4	1/8"	1/32"	"
250 "	22"	8	1/16"	1/16"	Elevator
1874 "	20"	3	1/8"	1/32"	Conveyor
520 "	20"	4	1/8"	1/32"	"
506 "	18"	6	1/16"	1/16"	Elevator
1765 "	18"	4	1/8"	1/32"	Conveyor
285 "	16"	6	1/16"	1/16"	Elevator
1450 "	16"	4	1/8"	1/32"	Conveyor
516 "	14"	6	1/16"	1/16"	Elevator
509 "	14"	4	1/16"	1/32"	Conveyor
420 "	12"	6	1/16"	1/16"	Elevator
385 "	12"	4	1/16"	1/32"	Conveyor

We will cut any of above rolls. Advise desired lengths and widths and we will promptly quote prices. Many other sizes in stock for immediate shipment.

CARLYLE RUBBER CO., Inc.

62 Park Place **New York, N. Y.**

You can't start work on any kind of a construction job until you have the tools to work with. Neither can one sit idly by waiting for delivery promises to materialize. The solution to the problem is to buy REBUILT and REGUARANTEED equipment and machines from us. WE DELIVER NOW. Here are a few items from our $1,000,000 stock of equipment. Send for our 64 page stock list.

AIR COMPRESSORS

Portable and stationary, belt with elec. or gas power, sizes from 20 cu. ft. to 1,000 cu. ft.

BINS

9—1 150-ton Blaw Knox, 2 118-ton Blaw Knox, 1 117-ton Blaw Knox, 1 72-ton Blaw Knox, 1 51-ton Blaw Knox, 1 35-ton Blaw Knox, 2 30-ton Johnson. Above with or without weigh batchers. All of the above are 2 comp. bins.

CABLEWAYS

1—Lidgerwood 15 ton cap. cableway, 2300' span, with Lidgerwood 12¼x15 steam hoist, with or without steel towers.

CRANES, DRAGLINES AND SHOVELS

1—Link Belt K-55, ser. No. 1698, 70' boom, 2 yd. bucket, also have a 2 yd. shovel attachment.

1—Link Belt K-48, ser. No. 1728, 60' boom, 2 yd. bucket.

1—Northwest Model No. 5, Serial No. 3572, 50' boom with 1¼ yd. pull shovel attachment.

1—Link-Belt model K-42, ser. No. 1265, 45' boom, 1¼ yd. bucket, also 1 yd. trench hoe att. or 1¼ yd. shovel front.

1—Northwest Model 104, ser. No. 2079, 45' boom, 1¼ yd. bucket; with 1 yd. shovel attachment.

3—Northwest Model No. 4's, Ser. No's. 3441, 3445, 3493, with 40' boom and 1 yd. pull shovel attachments.

2—Northwest model 105, ser. No. 1645, 1522, 40' boom, 1 yd. bucket.

3—Osgood Heavy Duty, ser. No. 2069, 2087 and 2403, 40' boom, 1 yd. bucket and with 1 yd. shovel attachment.

1—Erie gas-air ser. No. 4365 with 45' boom and 1¼ yd. shovel attachment.

1—Thew ¾ yd. gasoline shovel with ¾ yd. shovel front and 40 ft. crane boom, Serial No. 2801.

1—Koehring Model 301, Ser. 544, 40' boom, ¾ yd. bucket.

1—P&H Model 206, Ser. No. 1901, ¾ yd., 40' boom.

1—Byers Bearcat Model No. 128, ½ yd. cap., ser. No. 4119 with 30' boom.

1—Byers Bearcat model 27, ser. No. 5289, 30' boom, ½ cl. sw. ½ yd. bucket.

1—Erie Steam Crane, ¾ yd., 40' boom.

CRUSHERS

5—Gyratory crushers: 1—No. 5 Allis-Chalmers; 1—No. 5 Austin; 1—No. 5 Gates; 1—No. 3 McCully; 1—No. 6 McCully.

16—Jaw Crushers: 3—15x36" Universal; 1—15x36" Cedar Rapids; 1—15x26" Champion; 1—12x20" Acme; 2—10x20" Climax No. 2½.

1—Set of Allis-Chalmers, smooth type crushing roll 42x16".

DREDGE PUMPS

1—10" Morris Dredge pump to direct connect to motor.

3—Belt driven: 2—Morris Mang. 1—10", 1—8", 1—6".

EQUIPMENT CORPORATION OF AMERICA

CHICAGO — 1119 S. Washtenaw, Phone: Nevada 2400

PHILADELPHIA—1506 Race Street, Phone: Rittenhouse 4664

PITTSBURGH — P. O. Box 933, Phone: Federal 2000

NEW YORK — 30 Church Street, Phone: Worth. 2-0036

GOOD VALUES

48 x 60" Traylor Jaw & 200 HP 440 V. Motor.
No. 3 Northwest ¾ yd. Shovel-Crane-Dragline.
No. 600 P & H 1 yard gasoline crawler crane.
20 ton Whitcomb Gas Loco. 36" and 4'8½" Ga.
25 ton Link Belt Steam Locomotive Crane.
120-150-200-240-440-550 HP. Diesels.

MISSISSIPPI VALLEY EQUIPMENT CO.
515 Locust St. St. Louis, Mo.
SEND US YOUR INQUIRIES.

New—RAILS—Relaying

ALL SECTIONS

Also contractors' equipment, "V" shaped and Western cars, 24 and 36-in. gauge, portable track, gas locos, frogs and switches. Attractive prices quoted. Wire, write or telephone for quotations.

M. K. FRANK

480 Lexington Ave. New York, N. Y. — 25 St. Nicholas Building Pittsburgh, Pennsylvania

WIRE ROPE

USED — GRADED
STANDARD BRANDS

We carry a large stock of 1" and 1⅛ " Dia. Imp. Plow Steel Wire Rope with Hemp & IWRC. Lengths from 500' to 1500'.
"Excellent for Shovels, Draglines & Hoisting."
All Rope in A-1 Condition
Write for Particulars

GARRY CABLE COMPANY
28 W. 15th Street, New York City, N. Y.

18 x 24" McL & S, 36 x 60" Fairmont Sgl Roll Crushers.
30 x 30", 36 x 16" Traylor, 54 x 24" Allis C Dbl Roll Crushers, 2' Symons Cone Crusher, Fine.
8 x 36", 15 x 36" Universal, 10 x 42" Acme, 10 x 30" Champion R, B Jaw Crushers.
No. 9, 13 McCully, No. 10, 25-S, 37 Kennedy, No 8 Gates, Gyratory Crushers.
Barber Greene Loaders, No. 24, 25, 42.
Shovels, Cranes, Screens, Conveyors, Elevators.
100 HP Fairbanks Morse Diesel, Complete $1250.
What Do You Need? Ask for Bulletins 54 & 55.

MID-CONTINENT EQUIPMENT CO.
710 Eastgate Pa 2290 St. Louis, Mo.

NEW AND USED PIPE FOR EVERY PURPOSE
STEEL BOLTED TYPE BINS

Jos. Greenspon's Son Pipe Corp.

National Stock Yds. (St. Clair Co.) Ill.

¾ yd. 60 Thew caterpillar shovel; electrically operated. We can change to gasoline or diesel operated.
2' Symonds cone crusher, coarse bowl.
Air compressors: 100 to 1500 cubic feet.

WM. C. JOHNSON & SONS MACHINERY COMPANY
1211 Hadley Street, St. Louis, Mo.

DRYER

1—70" x 35'—0" Class A-10 Ruggles-Coles Dryer. We manufacture dryers and kilns of all sizes.

McDERMOTT BROS. CO.
ALLENTOWN, PA.

NEED DUMP CARS? Immediate Delivery

1, 30-yd. Clark, d/t doors
8, 24-yd. Koppel
15, 20-yd. Koppel
7, 20-yd. Western
24, 16-yd. Western
15, 16-yd. Kilbourne & Jacobs

Illustrated specifications available
OTHER TYPES OF CARS TOO
Also Locomotives, Cranes, Shovels, Etc.

IRON & STEEL PRODUCTS, Inc.
13492 S. Brainard Ave., Chicago, Illinois
"ANYTHING containing IRON or STEEL"

2½ yard Beaumont Cable Track Dragline. 80 ft. steel mast. Two speed 150 H.P. motor. Excellent condition.

MANNING AND LOCKLIN NORTHVILLE COMPANY
15880 James Couzens Highway
DETROIT, MICHIGAN

TRY A CLASSIFIED AD — IT PAYS

BINS

1—1200 (twelve hundred) tons, all steel four compartment.

LOCOMOTIVE CRANES

1—15 ton Brownhoist.
1—22½ ton Orton & Steinbrenner.
1—25 ton Industrial.
1—30 ton Ohio.
All of the above with double drums, thoroughly modern with National Board Boilers.

GANTRY CRANES

3—4 motor type AC current bucket operating 5 and 10 tons capacity having spans 17'6"—46' and 61'6" some with overhang some without. Ideal for material handling and concrete piles, etc. Excellent condition.

SPREADER CAR

1—Jordan all steel spreader standard gauge rebuilt.

AIR DUMP CARS

8—Koppel 20 yd. capacity, excellent condition.

CLAMSHELL BUCKET

1—Blaw Knox 1 yd. capacity clamshell bucket, Model 616.

DRAGLINE BUCKET

1—Sauerman 1 yd. capacity dragline bucket with carrier equipment.

SINGLE ROLL CRUSHER

1—24" x 24" all steel single roll crusher. Condition same as new.

CRUSHING ROLLS

2—Sets of Buchanan all steel crushing rolls 48" diameter, 30" face. Condition for immediate service and delivery.
1—Set Buchanan 14 x 30.

DIESEL OIL ENGINE

1—450 H.P. 4 cylinder, 4 cycle, solid injection 225 RPM with or without 300 KW AC 2200 volt generator.

JAW AND GYRATORY CRUSHERS

All sizes and types.

HOISTS

1—Sullivan electric dragscraper or sluicing hoist, double drums, 60 H.P. 440-2200 volt AC motor.
1—Sauerman steam slackline or cableway hoist, cylinders 10 x 12.
1—Sauerman double drum dragscraper hoist, electric, 75 H.P. AC 440 volt.
1—60" dia. x 36" face.
1—72" dia. x 30" face single drum mine type hoist, 150 H.P.
1—78" dia. x 72" face, 300 H.P.
1—50" dia. single drum hoist, 100 H.P. motor.

DRYERS

1—6' x 60' single shell. 1—76" x 56'.
1—6' x 30'. 1—50" x 40'.

DREDGE PUMP

1—Morris 10" dredge pump, manganese fitted, belt drive.

MOTOR GENERATOR SET

1—100 H.P. 440 volt AC to 65 KW 230 volt DC.

LOCOMOTIVES STANDARD GAUGE

3—Baldwin 2-6-2 type, cylinders 17 x 24, tractive effort 23,100 lbs., oil burning with tenders.
2—Baldwin 2-8-0 type, cylinders 18 x 24, oil burning with tenders.
1—Vulcan 66 ton 0-6-0 saddle tank, cylinders 18 x 24, National Board boiler.
1—Porter 50 ton 4 wheel saddle tank, cylinders 16 x 24".
6—Plymouth and Whitcomb 7 and 8 ton gas.

LOCOMOTIVES NARROW GAUGE

6—Vulcan and Porter locomotives 15 to 25 tons, steam, 36" gauge.
6—Plymouth and Whitcomb 5, 7, 12 and 16 tons capacity; 24, 30 and 36" gauge, gas.
Vulcan, Porter and Heisler 15 to 40 tons, 36" gauge, steam.

SHOVEL

1—P & H, Model 900, full revolving crawler tread diesel powered shovel, 3 or 3½ yd. dipper, 200 H.P. Fairbanks Morse diesel motor. Weight 311,000 lbs., for sale or rent. Located Cooley, Minnesota.

STONE CRUSHING PLANT

1—850 tons capacity per day, primary crusher, jaw crusher, two secondary crushers, vibrating screens, etc.

WE WILL BUY ANY MODERN PIECE OF EQUIPMENT ANYWHERE

A. J. O'NEILL
Lansdowne Theatre Building
Lansdowne, Pa.
Philadelphia Phone Madison 8300

CONCRETE EQUIPMENT

Blaw Knox complete central mixing plant.
Blaw Knox complete ready mix concrete plant.
Butler 100 yd. 3 compt. bin, weigh batcher.
10 Blaw-Knox 3 yd. Ready-Mix Bodies.
Steel bin, 75 yds., single compt., sand and gravel.
Beaumont 42 yd. two compt. bin.
200 ton rock storage bin, steel, heavy construction.
Fuller Kinyon bulk cement unloader, portable.
Fuller C40 rotary air compressor, electric.
Smith 1 yd. tilting mixer, electric.
Ransome 28-S 1 yd. stationary mixer, elec.
Haiss bucket loader, caterpillar.
Barber Greene Model 42 bucket loader, cats.
Barber Greene Model 62 bucket loader, cats.

BUCKETS—STONE SKIPS

22—Steel stone skips, 2 to 3 yds.
1½ yd. heavy duty Blaw Knox digging bucket.
1¼ yd. heavy duty Blaw Knox, digging, clamshell.
1½ yd. Hayward rehandling clamshell.
1 yd. Hayward clamshell, rehandling.
¾ yd. Haiss rehandling, clamshell.
1 yd. Hayward orange peel, 4 leaf.
¾ yd. Hayward orange peel, 3 leaf.

SHOVELS—CRANES

2—Marion Diesel shovels, 1—⅝ yd. cap.
2—Marion Steam shovels, 1½ yd capacity.
P & H Model 600 1 yd. gas crane.
No. 50-B Bucyrus Erie electric shovel, 2 yds.
Northwest Model 105 ⅝ yd. gas crane.
Northwest 1½ yd. gas crane, 60' boom.
Browning 13½ ton comb. truck crane-shovel, ⅝ yd.
Northwest 1 yd. comb. shovel-crane, gas.
Universal 7½ ton truck crane, pneumatics.

TRACTORS

RD-4 Caterpillar, with bulldozer.
D-5 Caterpillar, with bulldozer.

LOCOMOTIVES—CARS

2—Vulcan 6 ton, gas, 36" gauge.
2—Whitcomb 4½ ton, gas, standard gauge.
8—8 yd. V type 36" ga. side dump cars.

CRUSHERS—PLANT

Gyratory crushers: E.V.S. 30, 37-S, 42; Telsmith 32, 8A, 8B; Traylor 8"; McCully 12", 8", 6".
Jaw: 6x12, 9x16, 10x20, 12x26, 13x30, 15x30, 16x32, 36x48, 48x60.
Symons 4' cone crusher, complete.
Complete portable rock crushing plant, nearly new, with crusher, elevator, screen, etc.

RICHARD P. WALSH CO.
30 CHURCH STREET NEW YORK

Crushers
Jaw—10x4, 10x7, 15x9, 18x12, 20x10, 36x24—A Farrel & 36 x 28 Traylor
Gyratory—8" Traylor & No. 25 & No. 37 Kennedy
54"x20" & 42"x16" Crushing Rolls
Pennsylvania "Trojan" type Hammermill
Vibrating Screens
3x4' 1-deck Leahys 3x6' 2-deck Leahy
3x5' 1-deck Multirap 4x6' 2-deck Leahys
3x5' 1 & 2-d. Hummers 3x6' 1-deck Leahy
3x5' & 4x5' New "Toncap" Hummer Screens
Railway Equipment
8-ton 36"-gauge Whitcomb Gas Locomotive
4-ton 36"-gauge Vulcan Gas Locomotive
2—30"-g. Mercury Battery Locomotives
36"-g. 4-yd. V-dump Cars, hinged bodies
30"-g 2-yd. Koppel V-dump cars
5—24"-g. 1¼-yd. Easton V-dump cars
6—24"-g. ½-yd. Atlas End Dump Cars
1500' 25"-g. Portable Track & Switches
Belt Conveyors
16"x44' B-G and 20"x45' Portable Types
14" to 36" Rubber Belt, Idlers & Pulleys
14" to 30" wide Gravity Roller Sections
Gears, Shafts, Collars, Bearings, Etc.
Bucket Elevators: Open and Encased
5"x32', 7"x32', 8"x32', 10"x35', 12"x35', 14"x32', 14"x50', 16"x60', 20"x40', 24"x50'
New Chain, Buckets, Belt, Steel Casings, Gears, Clutches, Sprockets & Take-Ups.
Malleable type AA Buckets, 24"x20", 12"
150 New Cast & Steel Transmission Pulleys
Miscellaneous
⅝-yd. Byers Gas Shovel, skimmer & Boom
Clamshell Buckets, ½, ¾, 1¼ and 1½ yards
Inslee Bottom Dump Concrete Buckets
No. 7 Pilediving & No. 2 Sheeting Hammers
2000 Universal Form Clamps, ⅝" size
800-hp. Patterson Hot Water Feed heater
Hoskins Electric Furnace, 110/220-volts

G. A. UNVERZAGT, 15 Park Row, New York City

FOR SALE

Clamshell Buckets—Blaw Knox—½, ⅝, ¾ and 1 yd.
Dragline buckets—Page 1¼ and 2 yds.
Shovel dipper—1 yd. full manganese.
Locomotive Crane—Browning No. 5, 25-ton, steam, eight wheel, 50 ft. boom.
Marion Mod. 36, combination, 1½ yd., shovel crane and dragline.

P. A. HENAULT
2140 Book Bldg. Detroit, Mich.

Welding Outfits $29.75 to $76.06
Cutting Outfits $49.47
Welding Torches $11.78 up
Cutting Torches $17.93 up

Superior Oxy-Actylene Co.
Dept. W
Hamilton Ohio

LOCOMOTIVES SHOVELS — CRANES CARS

1—67 ton Porter 6-wheel Saddle tank, A.S.M.E. Boiler, Overhauled.
2—38 ton Vulcan 4-wheel Saddle Tanks, A.S.M.E. Boilers, Overhauled.
1—32 ton Porter 4-wheel Saddle Tank, Overhauled.

6—Covered Hopper Cement Cars, 70 ton.

1—17½ ton Brownhoist Locomotive Crane, Overhauled, New A.S.M.E. Boiler.

Crane or Dragline Fronts for Marion 37 and Bucyrus 50-B, One Each.

1—1½ Yd. Rehandling Clamshell Bucket, Practically New.

Birmingham Rail & Locomotive Co.
BIRMINGHAM, ALABAMA

Business Opportunities

FOR SALE

LIME RECLAIMING PLANT

Good Going Business—Low Operating Costs—Complete Equipment for Reclaiming Lime—Wonderful Opportunity with Unlimited Possibilities—Plant Is Adjacent to Accumulation of Carbide Sludge Containing an Estimated 30,000 Tons Hydrated Lime when Dried—Located in Indianapolis, Indiana—Original Cost Approximately $25,000.00—For Full Particulars.

Wire—Phone or Write

MICHAEL TAUBER & COMPANY

Webster 4500 411 So. Market St.
Chicago, Illinois

FOR SALE

1—Complete Hydrate Plant, large steel building, Clyde Hydrator, Raymond Mill, Storage Bin, tanks easily moved. Immediate delivery.

G. & W. H. CORSON
Plymouth Meeting, Pa.

FOR SALE

Up to 5000 Acres of Tennessee PHOSPHATE LANDS
Mineral Rights or Fee Simple
BEST AND SAFEST PLACE TO INVEST IDLE MONEY

H. D. Ruhm Columbia, Tenn.

Cement Colors

RICKETSON'S COLORS
SINCE 1885
16 STANDARD SHADES
Write for Samples and Technical Information today
Ricketson Mineral Color Works
Milwaukee, Wisconsin

Consulting Engineers

ARE YOU FACED WITH QUARRY BLASTING COMPLAINTS
Blasting vibrations graphically measured with automatic recording instruments.
VIBRATION MEASUREMENT ENGINEERS
211 WEST WACKER DRIVE CHICAGO
Telephone State 9363

F. M. WELCH ENGINEERING SERVICE
Consulting Engineers Greenville, Ohio
Designers of GRAVEL PLANTS for 30 years
SMALL PLANTS to meet local conditions with flexibility, ample crushing, minimum labor, low first cost and maintenance.
LARGE MODERN PLANTS for metropolitan areas.
GROUND STORAGE Plants.
OLD PLANTS modernized.
CONSULTATION REPORTS

W. R. BENDY
CEMENT ENGINEER
CLAVERACK, N. Y.
Offering the service of experienced cement engineers for special work at cement plants.

H. J. BROWN
CONSULTING ENGINEER
35 Doane Street Boston, Massachusetts
Specializing in Gypsum Plants and in the Mining, Quarrying and Manufacture of Gypsum Products.
Consultation Design
Examinations Construction
Reports Supervision

DIAMOND CORE DRILLING
HOFFMAN BROS. DRILLING COMPANY
PUNXSUTAWNEY, PA.
We drill for any mineral. We have more than fifty gasoline, electric and steam drills, adapted for any job. Satisfactory cores guaranteed. Our prices are right.
Established 1902 - - - Telephone No. 382

HORACE J. HALLOWELL
Analytical and Consulting Chemist
323 Main St. Danbury, Conn.
Specialty—The Chemical Analyses of Carbonate and Silicate Rocks

WE LOOK INTO THE EARTH
By using Diamond Core Drills We drill for Limestone, Gypsum, Talc, Fire Clay, Coal and all other materials.
PENNSYLVANIA DRILLING CO.
Drilling Contractors
Pittsburgh, Pa.

Positions Wanted

Do You Need a Good Assistant?
A steady, reliable, married man in late thirties, with twenty years' experience as Office, Traffic and Sales Manager in Crushed Stone business, desires a change. Excellent record. A-1 references. Address Box A-13, care of Rock Products, 309 W. Jackson Blvd., Chicago, Illinois.

Positions Wanted Cont'd

GRADUATE CHEMICAL ENGINEER employed as director of research, desires new connection as research or development engineer assistant to vice-president in charge of operations in progressive organization. Pacific coast preferred but not essential. Twelve years' experience in non-metallic minerals field. Specialties: Portland cement chemistry, cement manufacturing, concrete technology, ceramic materials, development research, combustion, crushing, grinding. Civil engineering, administrative, and consulting experience. Publications, member A.C.S., A.S.T.M., A.C.I., American born, married, age 35. Address Box A-14, care of Rock Products, 309 W. Jackson Blvd., Chicago, Illinois.

POSITION WANTED BY GRADUATE Chemical Engineer with 12 years experience in the Cement Industry. Experience has covered Chemical Process Control, Research, Geological Exploration for Raw Materials, Operation and Production of Special Cements, Concrete Service Work. Address Box 996, Care of Rock Products, 309 West Jackson Blvd., Chicago, Illinois.

Positions Vacant

WANTED—CONCRETE TECHNICIAN with at least 2 years experience in good concrete laboratory, to carry on investigations and experimental work in concrete and materials laboratory just being completed. State all qualifications, past employment, education, age, and salary requirements. Address Box A 12, Care of Rock Products, 309 W. Jackson Blvd., Chicago, Illinois.

BUYERS' FREE SERVICE

We are in the market for and would like to receive prices and literature on the items checked below:
RESEARCH SERVICE DEPARTMENT, *Rock Products*, 309 West Jackson Blvd., Chicago, Ill.

- ....Admixtures
- ....Aerial Tramways
- ....Aggregates (Special)
- ....Agitators
- ....Air Compressors
- ....Air Filters
- ....Air Separators
- ....Ash Receptacle Molds
- ....Asphalt Mixing Plants
- ....Batching Plants
- ....Bags
- ....Bagging Machines
- ....Balls (Grinding)
- ....Barges
- ....Batchers (Weighing)
- ....Bearings
- ....Belt Repair Equipt.
- ....Belting (Conveyor & Elevator)
- ....Bin Level Indicators
- ....Bins (Storage)
- ....Blasting Supplies
- ....Block Machines, Building
- ....Boats
- ....Brick Machines & Molds
- ....Buckets
- ....Building Tile Machines
- ....Bulk Cement Batching Plants
- ....Bulk Cement Storage Plants
- ....Bulldozers
- ....Bullscrapers
- ....Burial Vault Forms
- ....Calcining Equipment
- ....Calcium Chloride
- ....Carbon Dioxide Plants
- ....Cars (Industrial)
- ....Catch Basin Block Machines
- ....Cement Colors
- ....Cement Process
- ....Central Mixing Plants
- ....Chimney Block Mach. & Molds
- ....Clarifiers
- ....Classifiers
- ....Coal Pulverizing Equipment
- ....Concentrators
- ....Concrete Mixers
- ....Concrete Paints & Coatings
- ....Concrete Waterproofing & Dampproofing
- ....Contractors (Cement Mill)
- ....Conveyors
- ....Conveyor Idlers and Rolls
- ....Coolers
- ....Corn Crib Block and Tile Machines
- ....Correcting Basins
- ....Cranes (Crawler & Locomotive)
- ....Crushers
- ....Crushing & Screening Plants (Portable)
- ....Culvert Pipe Mach. & Molds
- ....Curing Equipment
- ....Curb Forms
- ....Derricks
- ....Dewatering Equipment
- ....Diesel Engines (Stationary & Automotive)
- ....Dippers & Teeth
- ....Disintegrators
- ....Dragline Cableway Excavators
- ....Drain Tile Machines
- ....Dredges
- ....Dredge Pumps
- ....Drills (Rock)
- ....Drill Bits
- ....Drill Sharpening Machines
- ....Drill Steel
- ....Drives (Gear Reduction)
- ....Dry Batch Conveyors
- ....Dryers
- ....Dust Collecting Systems
- ....Dust Precipitators
- ....Dust Recovery Plants
- ....Dynamite
- ....Electric Motors
- ....Electrostatic Separators
- ....Elevators
- ....Engineering Service (Consulting & Designing)
- ....Engines (Diesel, Gasoline, Steam)
- ....Feeders
- ....Floor Tile Machines
- ....Flotation Equipment
- ....Garbage Receptacle Molds (Concrete)
- ....Garden Furniture Molds (Concrete)
- ....Generators & M-G Sets
- ....Guns (Hydraulic)
- ....Gutter Block Machines (Concrete)
- ....Hoists
- ....Hoppers
- ....Hose
- ....Hydrators (Lime)
- ....Induced Draft Fans
- ....Joist & Slab Machines (Concrete)
- ....Kilns (Rotary, Shaft, Vertical)
- ....Laboratory Apparatus
- ....Lift Trucks
- ....Lime (Hydrated)
- ....Lime Handling Equip.
- ....Lime Plants
- ....Lime Putty Plants
- ....Loaders
- ....Locomotives
- ....Lubricants
- ....Manganese Steel Parts
- ....Mills (Ball, Compartment, Emery, Hammer, Rod, Roll, Tube)
- ....Mortar Mixers
- ....Pallets (Steel, Wood)
- ....Pans, Grinding (Wet & Dry)
- ....Perforated Metal
- ....Pipe (Dredge)
- ....Pipe Molds and Machines (Concrete)
- ....Plaster Mixers
- ....Pneumatic Hammers
- ....Portable Aggregate Plants
- ....Pulverizers
- ....Pumps (Pulverized Material)
- ....Railway Equipment
- ....Rectifiers
- ....Recuperators
- ....Refractories
- ....Rewashers (Screw)
- ....Rock Wool Cupolas
- ....Roofing Tile Machines
- ....Sand Drags
- ....Sand & Gravel Plants
- ....Sand Lime Brick Machinery
- ....Sand Settling Tanks
- ....Scales
- ....Scrapers (Power Drag)
- ....Screens (Revolving, Vibrating, Etc.)
- ....Seal Rings
- ....Septic Tank Molds
- ....Sewer Pipe Machines
- ....Shovels (Power)
- ....Silos (Storage)
- ....Silo Stave Machines
- ....Slakers (Rotary)
- ....Slurry Mixers
- ....Slurry Pumps
- ....Slurry Separators
- ....Slurry Thickeners
- ....Soft Stone Eliminators
- ....Speed Reducers
- ....Structural Steel Fabrication
- ....Tampers (Hand & Power)
- ....Tanks (Storage)
- ....Tires
- ....Tractors
- ....Transit Mixers
- ....Trucks (Agitator)
- ....Trucks (Dump)
- ....Trucks (Industrial)
- ....Trucks (Mixer Body)
- ....Unloaders
- ....Unloaders (Boat)
- ....Unloaders (Box Car)
- ....V-Belting
- ....Vibrators (Bin)
- ....Wagons (Dump)
- ....Wall Forms & Machines (Concrete)
- ....Washers (Sand, Gravel & Stone)
- ....Welding & Cutting Equipt.
- ....Well Curbing Mach. & Molds
- ....Wire Cloth
- ....Wire (Copper, Iron & Steel)
- ....Wire Rope
- ....Wire Rope Fittings

City _____
Individual _____ *Title* _____
Address _____
Firm Name _____ *State* _____

SEALED & 'ALEMITE' LUBRICATED CENTER SHAFT BEARINGS
LIGHTER ALLOYS USED, ELECTRICALLY WELDED FOR STRENGTH WITH LIGHTNESS
ADVANCED DESIGNS AFFORD INCREASED CAPACITY
SPECIALLY SHAPED COUNTERWEIGHTS PUSH MATERIAL A-WAY FROM SHEAVES & CABLE
EXCEPTIONAL CLOSING POWER FACILITATES HARD DIGGING
DROPPING SHOCKS AB-SORBED BY PATENTED STOPS
Outstanding Features
A few of which are mentioned herewith combine to make Owen buckets produce "A Mouthful at Every Bite and More Bites per Day," with long periods of service and freedom from repairs.
OwenBuckets
THE OWEN BUCKET COMPANY
6040 BREAKWATER AVE. • CLEVELAND, OHIO
BRANCHES: New York, Philadelphia, Chicago, Berkeley, Calif.

Index to Advertisers

American Cable Div. ..... Inside Back Cover
American Chain & Cable Co., Inc. ..Inside Back Cover
American Pulverizer Co. ... 81
Anchor Concrete Machy. Co. ... 68
Atlas Powder Co. ... 8

Bacon, Earle C., Inc. ... 84
Barber-Greene Co. ... 6
Baughman Mfg. Co. ... 83
Besser Mfg. Co. ... 60
Blaw-Knox Co. ... 83
Bradley Pulverizer Co. ... 69
Brooks Equipment & Mfg. Co. ... 85
Bucyrus-Erie Co. ..... Outside Back Cover
Butler Bin Co. ... 71

Chicago Perforating Co. ... 86
Chicago Steel Foundry Co. .. 87
Classified Advertising ...92-95
Cleveland Wire Cloth & Mfg. Co. ... 96
Clipper Mfg. Co. ... 72
Combustion Engineering Co., Inc. ... 21
Commercial Shearing & Stamping Co. ... 71

Deister Concentrator Co. ... 89
Deister Machine Co. ... 76
Dempster Brothers, Inc. ... 47
Denver Equipment Co. ... 45
Diamond Iron Wks., Inc. ... 97
Dixie Machinery Mfg. Co. ... 88
Dunn, W. E., Mfg. Co. ... 69
Du Pont, E. I., de Nemours & Co. ... 3

Eagle Iron Works. ... 98
Ensign-Bickford Co. ... 16

Flexible Steel Lacing Co. ... 85
Fuller Co. ... 10

Gardner-Denver Co. ... 86
Gay, Rubert M., Div. ... 85
Gruendler Crusher & Pulv. Co. ... 91
Gulf Refining Co. ... 4

Hardinge Co., Inc. ... 82, 84
Hardsocg Drill Co. ... 91
Harnischfeger Corp. ... 5
Harrington & King Perf. Co. ... 90
Hayward Co. ... 86
Hendrick Mfg. Co. ... 83

Industrial Brownhoist Corp. 89
Ingersoll-Rand Co. ... 18

Jackson & Church Co. ... 72
Jaeger Machine Co. ... 65
Jeffrey Mfg. Co. ... 85

Kent Machine Co. ... 68
Keystone Driller Co. ... 79
Koehring Co. ... 13
Kramer Corp. ... 72

Leschen, A., & Sons Rope Co. ... 57
Lima Locomotive Works, Inc. (Loco. Div.) ... 98
Link-Belt Co. ... 1
Ludlow-Saylor Wire Co. ... 17

McLanahan & Stone Corp. .86
Marmon-Herrington Co. ... 86
Master Builders Co. ... 67
Murphy Diesel Co. ... 78

National Powder Co. ... 56
National Wire Cloth Co., Inc. ... 55
Nordberg Mfg. Co. ... 9

Owen Bucket Co. ... 96

Pennsylvania Crusher Co. ... 86
Productive Equipment Corp. 87

Quinn Wire & Iron Wks. ... 71

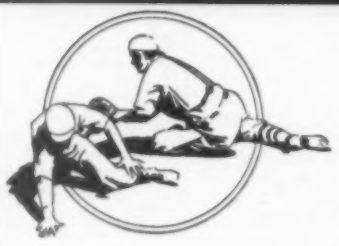
Raymond Pulv. Div. ... 21
Robins Conveying Belt Co. . 83
Roebling's, John A., Sons Co. ... 11, 79
Ross Screen & Feeder Co. ... 89
Ryerson, Jos. T., & Son, Inc. ... 22

Sauerman Brothers ... 81
Schaffer Poidometer Co. ... 90
Screen Equipment Co. ... 57
Simplicity Engineering Co. . 80
Smidth, F. L., & Co. ..... Front Cover
Smith Engineering Works. . 12
Smith, The T. L., Co. ... 77
Straub Mfg. Co. ... 81
Stulz-Sickles Co. ... 86
Sturtevant Mill Co. ... 36

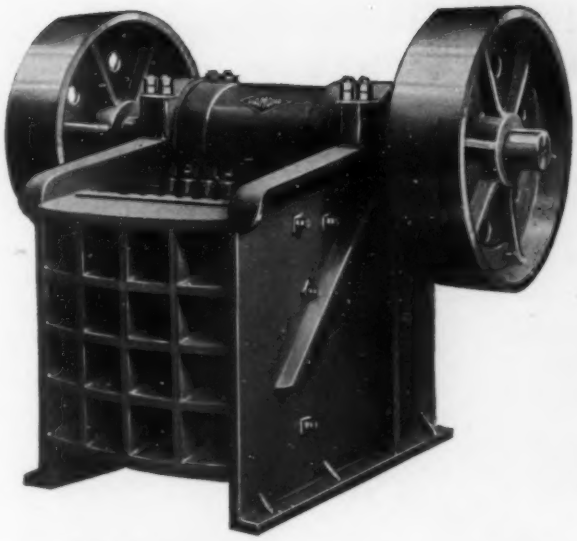
Taylor-Wharton Iron & Steel Co. ... 77
Traylor Engineering & Mfg. Co. ... 7
Tyler, W. S., Co. ... 88

Universal Road Machy. Co. 85
Universal Vibrating Screen Co. ... 47

Wall-Colmonoy Corp. ... 81
Wickwire-Spencer Steel Co. 97
Wilfley, A. R., & Sons, Inc. 86
Williams Patent Crusher & Pulv. Co. .Inside Front Cover



PLAY
SAFE!!
BUY WOVEN WIRE SCREENS
RUGGED AND ACCURATELY BUILT FOR VIBRATORS OR ROTARIES
ALL METALS ALL MESHES
THE CLEVELAND WIRE CLOTH & MFG. CO.
3574 E. 78TH STREET . . . . . CLEVELAND, OHIO.



DIAMOND Crushers are built for high production at low cost

DIAMOND long jaw design is responsible for high, uninterrupted production and unfailing uniformity. A highly efficient face contour assures positive grip and crushing effect on the upper or feed end of the jaws. This curve at the lower or discharge end of the movable jaw creates a parallel action of the stationary jaw and produces a uniform product.

Whether for primary breaking or for the production of fines, there's a rugged, high production DIAMOND jaw or roll crusher in a size to meet your requirements.

DIAMOND ENGINEERS

Will gladly help you work out in the most economical manner any crushing, screening and conveying problems that may confront you. Their skilled service is at your command, and we will welcome your inquiry and give it immediate attention. No obligation, of course.

JAW CRUSHERS
ROLL CRUSHERS
VIBRATING SCREENS
ROTARY SCREENS
SHAKER SCREENS
GRIZZLIES
CONVEYORS
ELEVATORS
BINS

DIAMOND Portable Plants

Marvels of flexibility, high efficiency and economical operation, DIAMOND portable plants are built in a wide range of sizes and capacities. DIAMOND plants embody many exclusive and patented features, all making for easy portability, fast uninterrupted, low cost operation and long years of dependable service.

ASK for bulletins covering any items of interest. They will be sent promptly. And remember, our engineers will gladly offer their suggestions.

ADDRESS INQUIRIES TO DEPT. RP9

DIAMOND IRON WORKS, INC.
ESTABLISHED 1886
AND THE NORE MANUFACTURING CO. DIVISION
MINNEAPOLIS, MINNESOTA, U. S. A.

can you tell how far he can jump?

Neither can you tell from looking at Wickwire Rope how much more service it gives than usual high grade wire ropes. Use alone will prove it.

We invite this comparison. Install a Wickwire Rope of the design recommended by our representative. Use it to destruction. Then compare its per-unit-of-use cost with that of any other rope you have ever used. Our bid for your business is based upon your attaining lower rope costs.

While Wickwire Rope is premium quality, its price-per-foot is no more than other recognized brands.

WICKWIRE SPENCER STEEL COMPANY
General Offices: 500 Fifth Avenue, New York City; Sales Offices and Warehouses: Worcester, New York, Chicago, Buffalo, San Francisco, Los Angeles, Tulsa, Chattanooga, Houston, Abilene, Texas, Seattle. Export Sales Department: New York City

MAXIMUM HAULING . . .

At A Minimum Cost!

At the quarry, where smooth, quick power is a vital factor; the Lima Shay Geared Locomotive is an important production unit. Lima Shays are designed to haul maximum payloads over the toughest grades quickly and economically.

The design of the Shay, with all parts readily accessible, facilitates the job of lubrication, adjustment, or repairs. Investigate the full possibilities of Lima power in your quarry.

LIMA LOCOMOTIVE WORKS, Incorporated
LIMA, OHIO
Sales Office: 60 E. 42nd St., New York, N. Y.

DON'T BURY YOUR HEAD IN THE SAND .....

Wide awake operators using Eagle washers and dewaterers aren't hiding their heads in sand. They are finding that the best way for profitable operation is to be sure of meeting tough specification demands. Many plant operations were unable to produce highway specification paving materials until they had modernized their equipment by installing Eagle Washers and Dewaterers.

Years of experience have proved the extremely high efficiency, low operation cost, large capacity and long life of Eagle washers and dewaterers.

Eagle makes a complete line of soundly engineered, high quality plant equipment—Spiral screw washers . . . Paddle type log washers . . . Sand tanks . . . Sand drags . . . Sand dewaterers . . . Shale removers . . . Sand and gravel crushers . . . Swintek screen nozzle ladder.

Let us show you how Eagle equipment will earn dividends for you.

EAGLE IRON WORKS
Des Moines, Iowa

● One wire rope looks pretty much like another. But some ropes stand up better than others and make your buying money go farther. You can't *guess* what different ropes will do but you can easily keep a performance record. . . . Then you'll *know* what service your rope gives—how many hours or tons of work—how often replaced—and how much time lost for replacement. In short, you'll know exactly what you get for what you pay. . . . American Cable TRU-LAY Preformed Wire Rope shows up exceptionally well in comparative performance tests. It spools even, it handles easy, it reeves fast. Thanks to the preforming we give it. Yes, we like performance tests on TRU-LAY Preformed because they prove this rope extremely economical. . . . Write today for a supply of WIRE ROPE SERVICE RECORD FORMS. They are free. Their use will help increase production and lower costs. They may be used with any type or make of wire rope. And remember this—the use of TRU-LAY Preformed helps conserve the Nation's supply of steel because it gives much longer service.

AMERICAN CABLE DIVISION • WILKES-BARRE, PENNSYLVANIA

District Offices: Atlanta, Chicago, Detroit, Denver, Los Angeles, New York, Philadelphia, Pittsburgh, Houston, San Francisco

AMERICAN CHAIN & CABLE COMPANY, Inc.

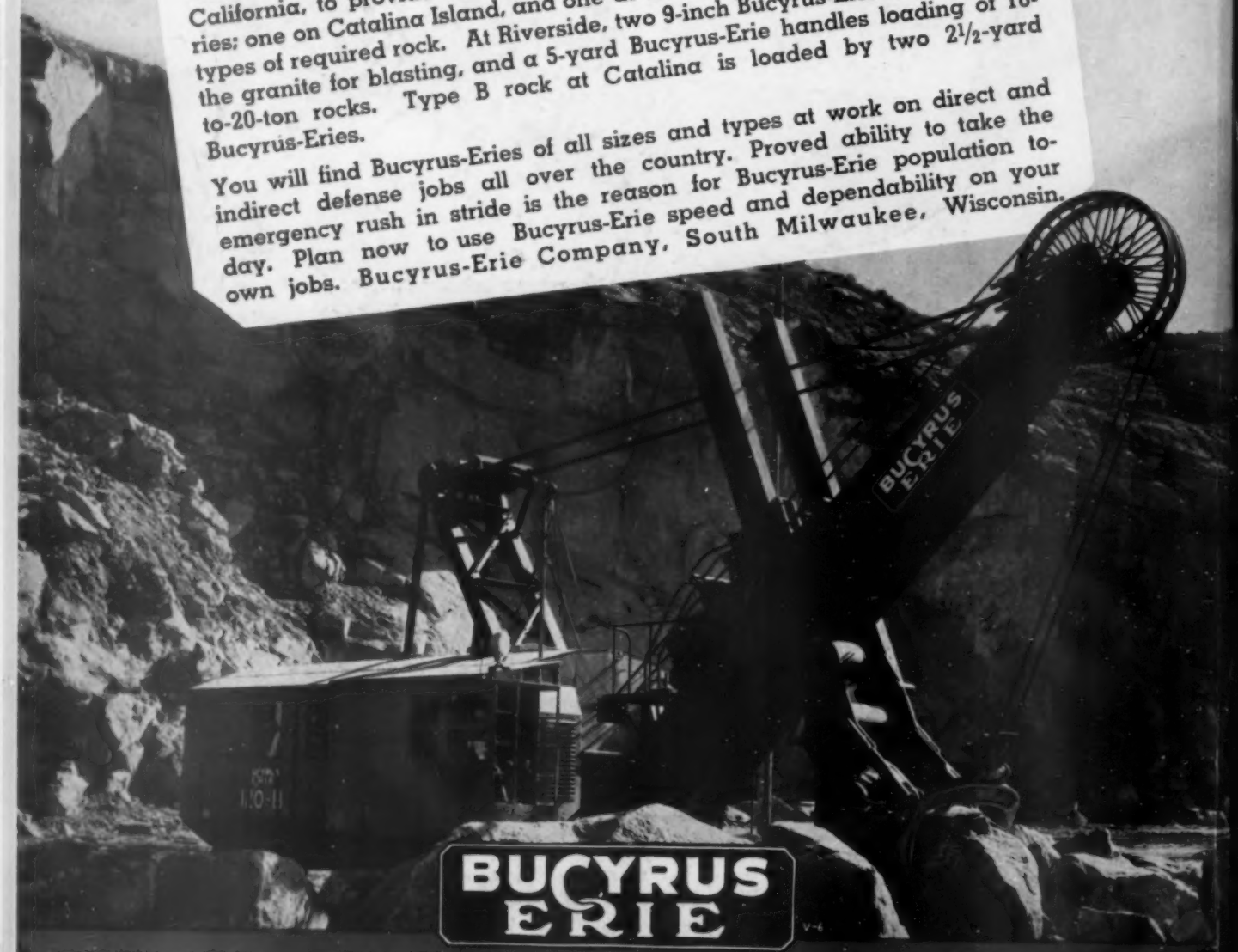
ESSENTIAL PRODUCTS . . . AMERICAN CABLE Wire Rope, TRU-STOP Emergency Brakes, TRU-LAY Control Cables, AMERICAN Chain, WEED Tire Chains, ACCO Malleable Iron Castings, CAMPBELL Cutting Machines, FORD Hoists and Trolleys, HAZARD Wire Rope, Yacht Rigging, Aircraft Control Cables, MANLEY Auto Service Equipment, OWEN Springs, PAGE Fence, Shaped Wire, Welding Wire, READING-PRATT & CADY Valves, READING Electric Steel Castings, WRIGHT Hoists, Cranes, Presses . . . *In Business for Your Safety*

TO MAKE A CRADLE OF THE DEEP

ROCK

STONE quarried by Bucyrus-Eries owned by Guy F. Atkinson Company, George Pollock Company is extending the breakwater at Long Beach, California, to provide berth space for the entire Pacific Fleet. Two quarries: one on Catalina Island, and one at Riverside, are furnishing the two types of required rock. At Riverside, two 9-inch Bucyrus-Erie drills prepare the granite for blasting, and a 5-yard Bucyrus-Erie handles loading of 10-to-20-ton rocks. Type B rock at Catalina is loaded by two 2½-yard Bucyrus-Eries.

You will find Bucyrus-Eries of all sizes and types at work on direct and indirect defense jobs all over the country. Proved ability to take the emergency rush in stride is the reason for Bucyrus-Erie population today. Plan now to use Bucyrus-Erie speed and dependability on your own jobs. Bucyrus-Erie Company, South Milwaukee, Wisconsin.



BUCYRUS ERIE

V-4

EXCAVATING, DRILLING AND MATERIAL HANDLING EQUIPMENT

THE GROUNDWORK OF DEFENSE